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ORIGINAL ARTICLES.

THE SURGICAL TREATMENT OF SUPPURATIVE PLEURITIS IN CHILDREN.

Read in the Section on Surgery and Anatomy, at the Thirty-Eighth Annual Meeting of the American Medical Association, June, 1887.

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In the very brief paper which I shall present, it is not my purpose to discuss tne history of this disease, its etiology, its pathology, its progress or its general treatment. I propose simply to confine my remarks to the comparative merits of the operation of removing the pus by the old method of the trocar and drainage tube, with the more modern one of resecting or excising a portion of one or more ribs, restricting this comparison of the two surgical procedures, to the cases ocurring in children.

It is known that as far back as the time of Hippocrates, the operation for the removal of pleuritic effusion, whether of pus, serum or blood, was practiced by the ancients, many crude and imperfect instruments being employed for this purpose, and circumstantial details of all the minutiæ necessary at each stage of the operation laid down by Hippocrates himself. Not until 1665, however, we are told, was the ordinary trocar introduced and the operation of draining off the contents of the pleural sac by this means resorted to.

It was demonstrated that the supposed danger of introducing atmospheric air into the pleural cavity was and still is, greatly exaggerated, and the consequent employment of the trocar for this operation became more general. Scultetus, perhaps the most ingenious and skilful surgeon of his day, invented several instruments for this purpose constructed upon the principle of the trocar, but so arranged as to prevent the admission of air into the pleural cavity. He also was the first, so far as I have been able to learn, to use a drainage tube. It is not necessary, however, in tracing the history of this instrument in this connection, that I should follow its varying popularity, its triumphs and its defeats through a period of two or more hundred years; we will leave the discussion by its advocates and its opponents, preceding the present half century, and endeavor to present a brief outline of its use during this latter period. The late Professor Gross, in the second volume of his "Surgery," after giving in detail minute directions how the operation of tapping the chest empyema should be done, using of course, the trocar, says that of 820 recorded cases but one death occurred by hæmorrhage in this operation; of 498 cases collected by Gunther in 1861, 302 were cured, 149 died, sixteen were improved, nineteen recovered with fistulous openings, and of twelve the result was unknown. Of 132 cases reported by Dr. Brady, 79 were cured. In a number of those which ended fatally irremediable ravages of the disease had occurred before the operation was done and others died of phthisis. Dr. Blake, of Boston, reported in 1879, nineteen cases operated on by incision as a means of introducing the drainage tube with fifteen recoveries. It is very much to be regretted that these cases have not been classified according to age, as the omission deprives us of the opportunity to compare the relative mortality between the adult and the child. In view, however, of the advanced and chronic condition of the disease so much more frequently met with in the adult with its accompanying results of extensive bands of adhesion, fibrous deposits and inspissated pus, it is fair to presume that the mortality was largely due to the fact that a majority of those operated upon were adults. If, however, with the acknowledged unfavorable conditions found in adult cases, such gratifying results could be obtained by the trocar alone or only partial drainage, how much greater success would have been achieved had these operations been confined alone to children, and if we add the still greater advantage of having used the drainage tube in each case, the result would undoubtedly have been more conclusively successful. Before further discussing the advantages of using the trocar and drainage tube over the operation of removing portions of ribs in children, we will refer to the recorded statistics of each of these procedures, embracing: *First*, a tabular statement prepared by Dr. Godlee of thirty-four cases of empyema in children treated at the North-Eastern Hospital, London, including four cases treated at the Brompton Hospital; *Second*, nineteen cases from the reports of St. Thomas' Hospital of children under 3 years of age.

Gross somewhere speaks of having operated 150 times by tapping followed by successful results in a majority of the cases, and Dr. Henry I. Bowditch in a letter recently addressed to me speaks of his last operation by tapping as the 399th. In neither of the latter reports have I been able to find that any tabulated statement was ever prepared, giving age, date of operation, specific conditions of each case and results in each.

TABLE OF CASES REPORTED BY DR. GODLEE.

No.	Age.	Duration.	Treatment.	Result.	No.
1	1 year.	3 months.	Aspirated January 9, 1883, 1 pint; Jan. 23, 6 oz.; Jan. 30, 4 oz. Opened Feb. 10, behind, rib removed.	Death. Empyema on opposite side.	1
2	1 yr. 3 mos.	1 month.	Aspirated July 11, 1884, opened July 26, part of 8th rib removed behind.	Cured in six weeks.	2
4	2 years.	6 weeks.	Opened August 1, 1885, rib removed behind; tube out August 13.	Cured in four weeks.	4
5	2 yrs. 4 mos.	9 weeks.	Aspirated July 4, 1885, opened through abscess July 7, tube removed July 15. Part of 7th rib removed; tube put back Aug. 7; finally removed Aug. 15.	Cured in nine weeks.	5
6	2 yrs. 5 mos.	14 days.	Aspirated Aug. 14, 1883; opened, rib removed behind Aug. 17, tube removed Sept. 1.	Cured in five weeks.	6
7	2 yrs. 6 mos.	8 months.	Aspirated Feb. 9, 1885, opened, rib removed behind, Feb. 28, tube replaced twice, counter-opening June 17.	Left in September, not quite healed.	7
8	3 years.	2 months.	Aspirated Aug. 20, 1883, opened August 24; rib removed behind; tube removed Oct. 2.	Practically cured in eight weeks.	8
9	3 years.		Aspiration failed; opened Nov. 14, 1883; rib removed behind.	Cured in ten weeks.	9
11	3 years.	5 months.	Aspirated Dec. 3, 1883, 2 oz., Dec. 4 1 oz; opened, rib removed behind Dec. 7.	Practically cured in seven weeks.	11
13	4 years.		Aspirated Oct. 31, 1884, 29 oz., sweet; Dec. 8, expectorated, 2 oz., fetid; opened Jan. 25, 1885; rib removed behind, pus fetid.	Cured in eight weeks.	13
15	4 years.	2 months.	Aspirated Aug. 9, 1885. Opened Aug. 5, rib removed behind. Tube removed Aug. 26, put back Aug. 31, finally removed Sept. 16.	Practically cured in five weeks. Tube removed too soon.	15
3	1 yr. 10 mos.	3 months.	Opened Nov. 23, 1881, behind; tube out Dec. 13.	Cured in five weeks.	3
10	3 years.	6 months.	Aspirated Nov. 25, 1884, 5 oz. very thick pus.	Cured by one aspiration.	10
12	3 yrs. 4 mos.	3 months.	Aspirated May 12, 1885, 4 oz.	Cured by one aspiration.	12
14	4 years.	3 months.	Aspirated April 28, 1884, one syringeful.	Cured by one aspiration.	14
16	5 years.		Aspirated April 7, 1882, 10 oz., April 9, 7 oz. Opened April 10. Tube re-inserted Sept. 9.	Practically cured in six months.	16
17	5 years.		Aspirated July 24, 1883, 4 oz., July 26, 11 oz. Opened Aug. 12, rib removed behind, tube left out Aug. 29.	Cured in four weeks.	17
18	5 years.	1 month.	Expectorated two months after commencement of illness.	Cured.	18
19	5 years.	5 months.	Part of 7th rib removed and tube put in Feb. 17, 1883, left out March 27.	Cured in six weeks.	19
20	5 yrs. 6 mos.	2 weeks.	Aspirated April 13, opened, 10, rib removed behind.	Cured in eight weeks.	20
21	5 yrs. 6 mos.	10 days.	Aspirated June 16, 1882, 26 oz. Opened July 1, 7, interspace, July 7, rib removed, tube left out Sept. 2.	Cured in fourteen weeks.	21
22	5 yrs. 6 mos.	4 days (?)	Aspirated May 12, 1884, opened 27, rib removed July 13, second opening further back.	General health good, but sinus remains Sept., 1885.	22
23	6 years.	5 weeks.	Aspirated Jan. 29, 1885; subcutaneous rupture near nipple; February 7, opened through abscess 6th interspace, no rib.	Cured in eight weeks. Trouble with tube.	23
24	6 years.	4 months.	Aspirated Jan. 10, 1885, opened, rib removed behind, 26th.	Small cavity remaining three months.	24
25	6 years.	4 months.	Aspirated Nov. 18, 1884.	Cured by one aspiration.	25
26	6 years.	6 weeks.	Aspirated July 7, 1885, opened, rib removed behind 17th, tube rem'd 29th.	Cured in three weeks.	26
27	7 years.	3 weeks.	Aspirated Aug. 24, 1883; 27th, 4 oz.; Sept. 1, 9 oz. Opened, rib rem'd behind Sept. 8, tube left out 20th.	Cured in three weeks.	27
28	8 years.		Aspirated April 10, 1882, opened 21, 7th interspace, no rib.	Cured in four weeks.	28
29	9 years.	9 days.	Aspirated May 2, 1882, 3 oz., 5th 22 oz., 19th 20 oz. Opened 23d, no rib. Tube removed July 19.	Cured in nine weeks.	29
30	10 years.	12 months.	Opened through abscess in 7th interspace, no rib, March 31, 1883. Pus vomited during operation.	Practically healed in seven weeks.	30
31	5 yrs. 6 mos.	5 months.	Sept. 6, 1883, piece of 6th rib outside nipple removed; healed; reopened Nov. 30.	Never completely healed. Died afterwards of bronchitis. (A very delicate child.)	31
32	6 yrs. 6 mos.	3 months.	June 18, 1885, incision.	Healed in three months.	32
33	7 years.	1 month.	Aug. 27, part of 7th rib removed.	Healed on Sept. 22 (under five weeks).	33
34	10 years.	5 months.	Dec., 1883, openings dilated; Feb., 1884, parts of 5th, 6th, 7th and 8th ribs removed; July 11, several other pieces of rib removed; Nov. 20, openings into 1st intercostal space.	Much improved. All closed but a minute cavity, into which a straight celluloid tube 2½ in. long was inserted.	34

The above statistical table, examined in detail, shows that the ages of those operated upon ranged from 1 year and 3 months to 10 years and 5 months: Three under 2 years, four under 3 years, five under 4 years, three under 5 years, eight under 6 years, five under 7 years, two under 8 years, one under 9 years, one under 10 years, and two under 11 years. Of the first group one was aspirated three times, no drainage tube used. Rib resected at the end of one month; died. One aspirated once, no drainage tube; rib resected fifteen days later, recovered in five weeks.

Of the second group one was resected and cured in four weeks; three were first aspirated, no drainage tube, subsequently resected and recovered. Of the third group, three were aspirated, no drainage tube use, finally portion of rib removed, followed by recoveries; two were cured by one aspiration. Group four shows that all three were aspirated, followed in two of them by excision of rib, with recovery in all three cases. Of the seven cases included in the fifth group, five were first aspirated, no drainage used, followed by removal of ribs in each case, resulting in cures. The remaining two were subjected to resection of ribs without being previously aspirated, also resulted favorably. The sixth group included four aspirations, no drainage tube in either case, subsequent resection of ribs with three cures and one partial success. Group seven embraces but two cases, one aspirated before the resection was performed, and the other rib excised at first operation; both cured. The eighth and ninth groups including one case each; both aspirared at first, but subsequently opened by incision and drainage tubes inserted; one recovered in four weeks and the other in nine weeks. The tenth group numbers but two cases, one cured by pleurotomy and drainage tube, the other greatly benefited by extensive resection of parts of the fifth, sixth, seventh, and eighth ribs, but not reported as cured. It thus appears of the thirty-one cases reported as cured in this table, twenty-five were subjected to the antecedent operation of aspiration, and six to primary resections: Four of the twenty-five were cured by one aspiration alone, the remaining twenty-one were all subsequently treated by removal of one or more ribs. It will be observed that in all the cases in which resection was practiced, the drainage tube was inserted and retained, as a rule, until the cure had been completed. Had such a plan been adopted in the first instance, when the operation of tapping was performed, it is more than probable that not one of the twenty-one children so treated would have been subjected to so grave and hazardous an operation as excision of the ribs. The four cases of recovery by one aspiration alone goes to demonstrate the conservative capacity of nature when left in a large degree, to her own resources, as well as the energetic and active process of absorption going on in childhood.

An analysis of this table shows that all but one of these cases were subjected to the operation of tapping before excision of the rib was resorted to. In one case four antecedent tappings, two cases of three tappings, two cases of two tappings, and nine having been tapped but once. As it was found

THE RESULT OF EXCISION OF A PORTION OF RIB IN FIFTEEN CASES OF EMPYEMA, FROM ST. THOMAS' HOSPITAL REPORTS, LONDON.

No.	Age.	Tapping before Operat'n.	Side.	Tube used before Operat'n.	Chronic Fistula.	Ab. Callus.	Result.
1	5½ male.	4	Left.	None.	None.	None.	Cured.
2	5 "	None.	"	"	Yes.	"	No benefit.
3	5 "	1	"	"	None.	"	Cured.
4	13 "	1	Right.	"	"	"	"
5	31 "	1	"	"	Yes.	"	Working (Cl'k)
6	13 "	3	Left.	"	None.	"	Cured.
7	44 "	2	"	"	"	"	"
8	58 "	1	Right.	"	Yes.	"	Died.
9	19 "	1	"	"	None.	"	"
10	24 "	3	"	"	Yes.	"	Some benefit.
11	20 "	2	"	"	None.	"	Cured.
12	23 "	1	Left.	"	"	"	"
13	25 "	1	"	"	"	"	"
14	34 "	1	"	"	"	"	Died.
15	23 Female	1	Right.	"	"	"	Cured.

Remarks.—Drainage-tube was used in all cases after excision of rib. The average stay in hospital was 185 days.

necessary to perform the operation of resection of one or more ribs subsequently, it is fair to suppose that the prior operation of tapping had failed to effect a cure. Of the whole number operated on 9 were cured, 3 died and 2 only benefitted. It will be observed that in all these 15 cases in which a portion of the rib was removed, drainage tubes were introduced, but in not one case in which tapping alone was practiced did the operator introduce a drainage tube; had this been done (which can always be easily effected by the use of a large trocar or enlarging with a bistoury, the opening made by the trocar), and the pleural cavity kept drained of its contents, the same favorable results would have followed and the more extensive and dangerous operation of resection been found unnecessary. In children it is rarely we find more than a single cyst, and when diagnosed in the early stages, more frequently contain serum than pus, hence the facility with which cures may be effected in such cases, sometimes by one or two aspirations only, but more surely when the drainage tube is used, to avoid a reaccumulation of the fluid and allow a speedy expansion of the lung. This, however, is not always the case; we sometimes meet with instances of pure purulent pleurisies in children where there has been no antecedent accumulation of serum or exudation of lymph upon the serous lining of the cavity, pus has been secreted from the very commencement of the attack and the cavity most usually in such cases found to be well filled. It has not been found that these conditions are associated with tubercular contaminations, but in those who are free from such hereditary tendency. In advocating the superiority of the trocar with drainage tube for the removal of these accumulations over the operation of resection of ribs, the following considerations present themselves to my mind as furnishing satisfactory reasons for such a preference.

First, as above stated in children the fluid is most frequently found occupying a single sac or cyst being

of recent date. The conditions found to exist in chronic cases, such as fibrous bands, pouches, sacs, forming numerous isolated cavities, inspissated pus, thickened pleuræ, etc., are absent. The compressed lung tissue has not undergone any parenchymatous changes affecting its natural elasticity, the mechanical pressure of the fluid being removed it readily resumes its normal capacity. The surfaces of the pleural cavity not having experienced those pathological changes usually found in chronic pyogenic membranes and the functions of absorption being more active in children, the partial removal of the contents of the sac by aspiration alone may give an increased impetus to that function and establish a cure by absorption.

It may be that the stimulus of atmospheric air plays some part as a conservative agent in adding energy to this process. Godlee, who it seems resorted to the operation of excision, in all of his cases, as reported in the table which I have quoted above, acknowledges in one of his papers that the operation of tapping children is often successful and recommends that in young subjects it should always be done at first and two or more tappings resorted to if necessary, before the graver operation of excision of rib be performed. He, however, fails to advise what in my judgment constitutes almost a *sine qua non* to early success in all these cases of tapping; the additional use of drainage tube. The objection which has been urged against this operation in children, namely, that the space between the ribs does not admit of using a trocar of sufficient calibre to accommodate a large sized tube and that it is almost impossible to keep the sinus or opening patulous for any length of time presents, to my mind, no significance, since the experience of those who practiced this operation through a long series of years, furnishes a positive contradiction to this criticism.

Every surgeon knows that such a difficulty can always be overcome by enlarging the opening with a common bistoury. In support of these views I here introduce the letter already referred to, of Dr. Henry I. Bowditch, of Boston, who has perhaps performed the operation of tapping the chest oftener than any other man now living. He says:

"For thirty-seven years I have been using the exploring trocar and suction pump in cases of pleuritic affection. Sometimes repeatedly in the same person, and generally with success if the patient has been seen early enough. Years since I began in several cases to make permanent openings by means of a large trocar and canula, the latter being left in the opening. I have injected, at times, simple warm water (would it not be well under modern antiseptic ideas to use almost hot water?), I have injected repeated syringefuls *until the water was returned apparently free of pus.*

"Generally, however, I have made no injection, if the patient with the free discharge has been improving.

"Exsection of a rib I have never deemed necessary in childhood, nor in adults when the patient has been seen early enough to be able to try the above operations, one or both, without success. I have advised it with advantage, in some cases, of adults. Like everything else that is good in this world, it has been at times of late used most inappropriately and extravagantly as in one of my own cases, while the patient was traveling in Europe and with death as the result. Nevertheless, I believe that used cautiously it will be of great advantage in certain chronic cases.

"As I have never seen a case in childhood where I have felt called on to advise exsection, so I feel indisposed to advise it now, if any other course promises success.

"I am sorry that I can not give you any more detailed statistics. In a general way I will say that I made my last operation (399th), on my 256th patient, Aug. 25, 1886."

It will be observed that this experienced and eminent surgeon fully endorses the views which I have endeavored to present in this paper. He says exsection of a rib I have never deemed necessary in children. With a record of 390 operations, a large proportion of whom were children, his judgment on this point is not only entitled to our respect but should be regarded as conclusive. Excision of a portion of one or more ribs for empyema as a substitute for, or supplementary to, the operation of tapping is a surgical procedure of comparatively modern date, although it has been claimed that it was first suggested, if not performed, by Celsus. In this country I believe that Dr. Warren Stone, of New Orleans, was the first to do the operation. Estlander, of Helsingfors, seems to have directed more general attention to this practice and extolled its peculiar merits. So far as I have been able to learn by reference to the recorded views of many distinguished surgeons of modern times, no distinction is made by them who advocate the operation of resection, between adults and children, perhaps, more frequently performed in cases of the latter than the former. So far indeed as the statistics of hospital practice within the last decade show, the rule has been to operate by resection in all cases of children.

As I have above stated in discussing the superior merits of tapping the conditions most usually met with in young children differ so materially from those encountered in the chronic cases of the pleuritis of adults, that I think age should be regarded as a factor of primary importance in determining the exact diagnosis as well as selecting the particular mode of surgical interference. When we consider the fact that the bony fabric of the chest in the child is still in a condition of progressive physical development, the rapid and excessive deposit of callus following the solution of continuity of a rib, protruding into the cavity of the chest and irritating the lung, the inevitable deformity and loss of symmetry in expansion of the two sides of the thorax, which is apt to follow the removal of one or more ribs, the growing condition of the child which necessarily adapts itself to the physical results of the traumatic interference, establishing often a permanent deformity, associated at times with more or less spondylitis, and a greatly restricted respiratory capacity of the chest; the

pouch of periosteum from which the excised piece of rib has been dissected; the protracted healing and long continued dressing of the open wound, augmenting the chances of septicæmia and exhausting the vital energies and recuperative resources of the little sufferer. We should hesitate before resorting to so grave a surgical procedure when a more simple and conservative one can be safely and successfully practiced.

In presenting the above criticism upon the operation of resection or removal of one or more ribs for the cure of empyema it will be remembered that I have reference to the operation upon young children exclusively, having in view simply a desire to call attention to the importance of discriminating carefully in the surgical treatment of these cases between adults and children.

Jacobi says: "Excision of the ribs should never be practiced in children."

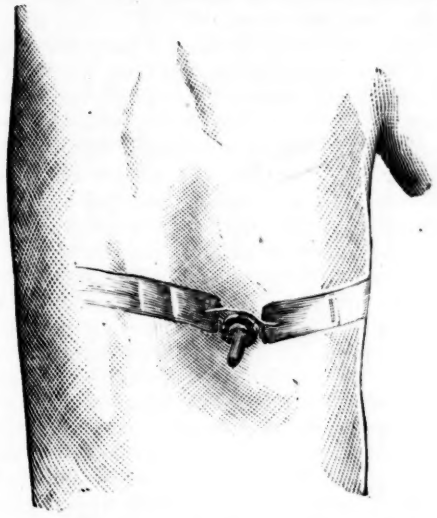
J. Lewis Smith says: "That he never could conscientiously recommend excision in any case in his practice, hospital or private."

T. Clifford Albutt says: "Resection of a portion of two or more ribs may be necessary in some cases, but such cases will become very rare as diagnosis and early operative relief are more generally understood." If I deemed it necessary I might add the testimony in support of my views upon this subject, of many other experienced and skilful surgeons. The following brief notice and accompanying photograph of a case upon which I operated some three years ago will serve to illustrate the simple but effectual procedure advocated in such cases.

This youth was sent to me from the country supposed to be far advanced in phthisis. Had suffered for six months with symptoms of tubercular consumption including expectoration of large quantities of pus. A careful physical examination revealed the presence of empyema of right chest, pleural cavity well filled with pus, and lung compressed against spinal column. I decided to tap him at once with a medium sized trocar, which was done through the sixth intercostal space, and about 32 oz. of pus drawn off. The cavity was not washed out nor was a drainage tube inserted. Great relief was afforded the boy and the cough almost entirely suspended.

In three weeks the pleural sac had refilled entirely with pus, all of the distressing symptoms returned and the patient and friends despondent. I now determined to repeat the operation of tapping with a large trocar, and introduced a soft rubber tube. At this operation nearly the same amount of pus was drawn off and after the cavity had been washed out with tepid water the tube was inserted and kept in its place by the device represented in the picture. A large piece of soft sponge moistened with carbolized water was placed so as to allow the end of the tube to rest on it and confined by a bandage, no antiseptics used.

Each succeeding day the cavity was washed out with tepid water, at first nearly one quart being used. In three weeks the cavity had so diminished by the expansion of the lung that but 1 oz. of fluid could be thrown in, and at the expiration of four weeks the tube was removed and the sinus allowed to heal. The patient continued to grow fat and strong and is now perfectly well. In this connection I may refer to the mooted question of using injec-



tions after drawing off the contents of the cavity. Many surgeons object to their use while others employ them. Dr. Cayly, of England, reports many cases of sudden death resulting from injections of simple water, solution of iodine and of carbolic acid. In all of which death occurred after repeated injections had been used with apparent impunity. As no explanation of the cause of death in such instances has been offered, and as the practice of using tepid water has been so generally and safely employed I can see no rational grounds for entertaining such apprehensions.

UTERINE SUBINVOLUTION AND AREOLAR HYPERPLASIA.

Read in the Section on Obstetrics and Diseases of Women, at the Thirty-Eighth Annual Meeting of the American Medical Association, June, 1887.

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Physiologically considered, the uterus is more subject to variations in size than any other organ of the human body. "Its weight, but little more than one ounce in the virgin state, increases during pregnancy to upwards of two pounds. After labor, in two days it falls to a pound and a half; during the first week to one pound. The cell elements are consumed, compression of nutrient blood-vessels cuts off fresh supplies from the oxidized protoplasm, and in from six to eight weeks the uterus is reduced to almost its normal proportions." If this tearing down and carrying away, by nature's forces, that structure which enveloped the child and nourished it during the period of intra-uterine existence, stops short of completion, we have the condition known as subinvolution or arrested retrograde evolution.

Pathological Anatomy.—Edis says: "In the early stages of subinvolution following parturition, hypertrophy of the muscular structure equally with that of the connective tissue may be found, but later on, in the large majority of cases, on microscopic examination, the amount of fibrous tissue predominates over the muscular fibre. Within a few days after parturition, the fully developed muscular fibres undergo a fatty degeneration, the fatty globules being absorbed and the uterus thus rapidly diminishes in size and weight." Should any cause retard or check this process, the uterus will remain flabby and large. Thomas says: "At first the tissues are infiltrated with serum. In process of time the uterine walls diminish in size; their tissues grow less vascular; the blood-vessels become smaller, and the uterine cavity assumes smaller dimensions, but the organ does not assume its original size. It remains large, dense, firm and sensitive for years, presenting the characteristic appearance of the so-called parenchymatous metritis. Cases which were formerly regarded as examples of inflammation on account of the existence of enlargement, congestion, and tenderness upon pressure, the microscope now *proves* to have been instances of excessive growth of connective tissue of the uterus, with resulting hyperæsthesia of its nerves."[1]

Klob states that diffuse growth of connective tissue constitutes the so-called induration hitherto considered as a result of parenchymatous inflammation of the uterus.

Has every congested, voluminous, tender and displaced uterus once contained an embryo or fœtus? Let us reason, that for from 25 to 35 years, the virgin uterus is subject to monthly enlargement and shrinkage, differing little, except in degree, from what occurs in the multiparous organ. The nervous system, especially the uterine plexus, is in a state of hyperæsthesia during menstruation, while the vascular supply, physiologically great, needs only to be disturbed by one or more causes, mental or physical, to produce blood stasis, followed by hypergenesis of connective tissue—precisely the pathological condition present in a vast majority of all chronic uterine disorders. Menstrual subinvolution is, then, worthy of consideration in this connection.

It has been shown that the position of the uterus varies widely within normal limits. It should also be borne in mind that "nidation and denidation," together with the vascular changes constantly taking place in the uterine mucosa, make it clear that the uterus has no permanent size, enlargement and shrinkage being the law of its existence during menstrual life. Hence there are many cases of so-called chronic inflammation not directly traceable to childbirth, and others in no way connected with it at all.

I further quote Prof. Byford: "The circulation of the uterus is increased in quantity from the cessation of one flow till the beginning of the next. During the days of the flow the afflux of blood subsides to the lowest amount. From the cessation of the monthly flow there is an increase of solid tissue in the uterus until the beginning of the next flow, during which time there is involution, or an elimination of solid tissue, notably the mucous membrane of the cavity. These processes of afflux of blood and *accessions of tissue may be and often are prolonged and pass into what is known* as *congestion* of the uterus." Again he says: "In both menstrual and post-partum subinvolution this simple vascular condition does not continue for any great length of time. Hyperæmia is often a *mischievous condition*, and sooner or later causes changes in the organization of the viscus in which it exists." In subinvolution there is at first hyperæmia with hypertrophy of the fibrous, vascular, and nervous tissues. These solid portions of the organ degenerate, not into fatty substance that may be absorbed, but into fibrous tissue of a low organization. Subinvolution is a term, then, which embraces different pathological conditions; or perhaps it would be expressing the facts better to say that several distinct pathological conditions of the uterus result from subinvolution. This last statement will apply equally to menstrual and post-partum subinvolution.

Etiology.—Emmet, in the second edition of his book, dismisses the subject of subinvolution with the statement that he has for many years found few or no cases of subinvolution not due to laceration of the cervix. In the third edition, in speaking of "Lacerations and their Treatment," he says: "A careful study of the history of the cases which have passed under my observation during the past five years, and have finally required operations, teaches, if anything, that a laceration of the cervix, however extensive, will rapidly heal without an untoward symptom unless blood-poisoning should take place. This occurrence is always accompanied by some general disturbance, and is marked by a septic cellulitis which obstructs the pelvic circulation so as to arrest involution and repair of injury." He then adds: "If this is proven it becomes a question as to how far the necessity for a subsequent operation, to repair the injury, may be limited or rendered unnecessary by the early care of the obstetrician."

I have seen fit to place this quotation under the head of causation, that it may aid in determining the relation of cause and effect between the arrested involution and the laceration. Emmet has given us the link, that was missing in his former editions, between the cause—laceration—and the effect—impaired health of the patient. This missing link, this arrested involution, is a factor prominently presented by this great master as worthy of consideration in connection with the operation for closing a laceration. In another place Emmet (2d ed.) gives us to understand that subinvolution may have constitutional causes. He says: "We will find, as a rule, feeble respiration in both lungs, with an increase of secretion throughout the air passages, the condition being best fitted for the rapid development of tubercle." Again he says: "This perverted state of the mucous membrane is, equal with subinvolution, an indication of some serious defect in nutrition." Low states of nutrition are among the predisposing causes, such as are found in prolonged nervous depression,

[1] Winckel's late work, by Prof. Parvin, treats this subject under the head of Chronic Metritis.

grief, worry, etc.; among the exciting causes, parturition oft repeated, opium to stop after-pains, which are but signals that nature is starting up healthy involution, and expelling clots. Further, opium hinders retrograde metamorphoses and lessens secretion. Want of stimulation to contraction from nursing child, or still birth, to which latter may be added grief, or over-exertion, or insufficient exercise following parturition, may be added. The uterus should contract by a vital force, such force not being obtainable by inactivity.

Torpid conditions of the liver and intestines, interfering with the return of blood from the pelvis through the portal veins; abdominal tumors pressing on the vena cava; septic instruments used by physicians, such as sound, etc.; unskilful manipulation of same; displacements; and as Klob states, its cause must be sought for in habitual hyperæmia. Emmet speaks of having found congestive hypertrophy of the uterus in ladies who have lived in malarious districts, especially the Southern States. This enlargement remained as a sequel of repeated attacks of remittent fever. The venous congestion of the pelvis and enlargement of the uterus were brought about after the muscles had lost their tone from the constant obstruction to the return of the circulation through the portal system.

Parturition may act simply as a predisposing cause. As Thomas states, a woman has a child, has no post-partum trouble and goes through involution perfectly. A year or two later she has endometritis. This in time produces areolar hyperplasia with its usual symptoms and physical signs; the same kind and degree of endometritis in a virgin would have lasted for years without parenchymatous complication. In the former case the endometric disease existed on ground as favorable to hyperplasia because an important predisposing cause existed. In the latter case such predisposition was wanting.

To illustrate more clearly how causes other than parturition may produce hyperplasia, I will give two examples taken from observation:

Case 1.—A lady with a perfectly healthy uterus being in great anxiety to prepare for a journey, neglected to evacuate the bowels for several days, puts on a tight corset dragged down by several heavy skirts; makes her journey, but before leaving the warm car does not empty the bladder; the excretion of urine is increased by the chilling carriage ride. The distended bladder pushes the fundus of the uterus backwards. The distended rectum pushes the cervix forwards, and, as she alights from the conveyance, the uterus turns backward into the hollow of the sacrum, its more complete impaction being insured by running up a flight of stairs or even high steps. Menstruation, which was due at this time, is delayed. She has pain, and becomes an invalid. A year later she is found to have complete retroversion with areolar hyperplasia, innervation, circulation and nutrition of the uterus having been deranged by the displacement.

Case 2.—A lady of feeble nutrition and circulation, by exposing and chilling the body near her menstrual period, has a leucorrhœal discharge which soon changes the normal chemical reaction of the cervical and vaginal secretions, the discharge becoming irritating, bathing the vaginal face of the cervix and denuding it of epithelium, and subsequently of mucous membrane. The Nabothian glands become swollen, the cervix, internal and external, granular. These raw surfaces admit of the absorption of septic material, which in time produces uterine and pelvic congestion. Each recurring menstrual period leaves the uterus a little larger than before, until continued hyperæmia results in areolar hyperplasia with displacements, menstrual disorders and all the symptoms, subjective and objective, found in subinvolution.

Diagnosis.—This requires skilled efforts and great dexterity in conjoined manipulation. The clinical history of no two cases will be the same. The morbid phenomena are frequently referable to the origin of the disease. The subjective symptoms will include dull, heavy, dragging pain through the pelvis, much increased by locomotion, dull pain beginning several days before menstruation and lasting during that process, pain in the breasts before and during menstruation, darkening of the areola of the breasts, nausea and vomiting, great nervous disturbance, pressure on the rectum with tenesmus and hemorrhoids, pressure on the bladder with vesical tenesmus, menstrual disorders and sterility.

Physical Signs.—If the disease be limited to the cervix, it will be found large, swollen and painful; the os patulous. On conjoined manipulation the cervix is found to be unduly sensitive, especially if it be lifted up by the finger. There is usually some leucorrhœa or granular degeneration present. In the early stage of subinvolution there is softness of the tissues, which is less noticeable in the more advanced forms of hyperplasia. Where the body of the uterus is involved, on conjoined manipulation the organ is found to be much enlarged, the thickness of the walls being greater than the increase in length. The uterus is lower in the pelvis and less movable than normal, from its intrinsic bulk, and is more sensitive to pressure than in health. The displaced uterus is often complicated with prolapsed and tender ovaries.

From the foregoing symptoms it will be seen that it would be no easy task to differentiate between subinvolution and early pregnancy, especially if the patient be yet a nursing woman, and no evidence could be gained by a return of the menstrual flow. The skilled hand ought to be able to detect the more globular shape of the uterus and the feeling of tension suggestive of a contained fluid. Nausea, pressure on the neck of the bladder, irritation of the breasts, etc., are often as well marked in subinvolution as in pregnancy, and therefore aid little in differentiation. Even a discharge of blood once a month may come from an abrasion on the neck of the uterus.

As between beginning fibroid tumors the differentiation is extremely difficult, especially if they are the same, except that in fibroids we have a local, in subinvolution a diffuse hyperplasia of connective tissue.

Prognosis.—This will depend upon the general condition of the patient, what she will submit to, and

the extent of the replacement of normal muscular tissue by the abnormal connective tissue.

Treatment.—Keeping in mind the fact that this condition is not inflammatory, but one of debility, in the vast majority of cases, the importance of constitutional treatment is self-evident. The most perfect state of secretion and excretion possible should be secured and maintained, to the end that the highest degree of assimilation and nutrition shall furnish plenty of blood, rich in red corpuscles, to aid in ridding the uterus of its redundant fibrous tissue. The full, free expansion of the lungs by atmospheric pressure, uninterfered with by corsets or heavy skirts, is absolutely essential to keep the blood pure. A sufficient amount of muscular movement is required to keep the blood in circulation through the capillaries, especially of the skin.

If the patient cannot go out riding or walking each day, opening the windows and doors while the patient is warmly covered, as suggested by Prof. Byford, will do much to maintain good respiration. The preparations of iron, strychnine, ergot, quinine, etc., are of great benefit in most cases.

Local Treatment.—So high an authority as Emmet declares that he "has seen few cases of subinvolution not due to laceration of the cervix." Admitting the truth of this statement, the important question would be, What relation does the closure of a laceration bear to the cure of the patient? It must not be forgotten in this connection that we have precisely similar pathological conditions in uteri that have become normal in size after delivery and again enlarged from one or more causes which produce dilatation of the pelvic veins; and even in women who have not borne children at all, I often find it necessary to sew up a torn womb, even to cut away a considerable amount of tissue to get rid of the hyperplastic conditions and cicatrices. At the same time, *let me insist*, the operation is but one of several factors in the cure, and that, as an etiological factor and therapeutic necessity, it has been over-estimated and often abused.

Emmet (3rd and last ed.) says: "The simple existence of a fissure in the cervix does not justify an operation for its closure. Nor should the operation be ever resorted to except for the relief of symptoms which have remained after the accepted treatment has been employed without benefit." Again he says: "The operation has been performed too often, when no necessity for doing it has existed. It has been done quite as often without the proper preparatory treatment, even while more or less cellulitis existed, and still oftener with no clearly definite purpose in view. The result has been frequent disappointment, and not seldom the patient has suffered a great impairment of health. He also further states that it is necessary to give the preparatory treatment for the reduction of the *cellulitis* and the *rolling* in again of the tissues before it is safe to operate, and before we can even determine the need of performing it. If the operation for closing the laceration is performed after the different sources of irritation have been removed, the uterus will be reduced rapidly in size, and the patient will not only regain her health, but remain in the full enjoyment of it afterwards."

From these sensible statements, coming from the originator of the operation, I infer that the pelvic congestion and subinvolution are to be removed, as far as may be, before we *are warranted in operating.* Here again the pendulum of science, swung to extremes by a half mania for sudden cures, finds its equipoise on the *terra firma* of *sound surgical principles.* Do the best we can, operate as *perfectly* as possible, and even then, in my experience, after-treatment, by supports and dilating, is sometimes necessary. If this be proven it explains why we see and hear of so many women who have derived little or no benefit from an operation which they were told would cure. The wisdom we display in adapting our remedies, whether they be operations or drugs, to the particular stage of the disease, will determine the measure of our success. When the uterus is much enlarged, intra-uterine medication, to act upon the excessive mucous membrane, will often do good; the cervix must be well dilated, so that if fluid is to be expelled it will escape through the cervix and not the Fallopian tube, the dilating doing as much good as the medication. Churchill's tincture of iodine, nitrate of silver and hot antiseptic vaginal injections are precious remedies in pelvic diseases. Let me insist, however, their use requires a wise discrimination.

A slight subacute inflammation in the neighborhood of the uterus, involving possibly some of its ligaments, may cause a slight prolapse or displacement. A prolapsed ovary, a diseased Fallopian tube, a painful urethral caruncle, or even a fissure in the rectum, may so constantly irritate the pelvic nerves as to disturb innervation and circulation and produce uterine and pelvic congestion, which nature nine times out of ten would attempt to relieve by discharge of blood from the uterine mucosa, or of mucus or pus from the Nabothian glands in the cervix. These discharges being but the local expression of some morbid condition, their arrest by local applications is irrational. True, the patient may feel better for a time, as arrested outflow increases pressure, disturbs nutrition and facilitates hypergenesis of connective tissue, with its scanty blood supply and few nerve filaments.

Practitioners will never secure a few simple means of curing all the diseases found in such complicated structures as the human eye or woman's pelvis—remedies such as shall be universal in their application regardless of the intricacies of diagnosis. Such local means as deplete the distended veins and swollen glands will do good. Bennet's nitrate of silver being followed by a free discharge of blood on the second day, and stimulating uterine contraction, did good; he thought he cured ulceration and inflammation. Simpson and Sims, splitting the cervix, drained out the enlarged veins, securing better uterine nutrition by local depletion. The depletion attendant on an operation for closing a lacerated cervix is sometimes the measure of its benefit to the patient. Hodge, with his pessary, corrected malposition, restored normal circulation to the pelvic organs, and cured many a sufferer. Any displacement must be rectified in order to restore normal circulation, without which

normal innervation and nutrition are impossible. For more than two years I have substituted tampons of wool for those of cotton, for the former, by elastic pressure, replace organs better, relieving pressure irritation, and removing many reflex phenomena, thus doing vast good by local *depletion* and local *compression*. These should always be applied in a *definite* way and for a *definite* purpose, and if made antiseptic may remain for several days.

Vaginal injections with a Hilderbrandt's douche, which enables a competent attendant to use water 10°-15° hotter than can be borne by the external parts, is of decided benefit. Rapid, free and repeated dilatation with graduated steel sounds and dilators will, by pressure, excite absorption of the abnormal tissue not only of the cervix, but in the body of the uterus as well. The antagonistic action or law of uterine fibre, as laid down by Savage: that dilating the cervix causes contraction of the fundus, and *vice versa*, suggests that dilating is a valuable means. The lesson learned by dilating hypertrophied anal sphincters can be utilized in treating uterine hyperplasia.

The great sheet anchor is electricity. The constant current, employing 12 to 30 cells, used every third or fourth day, I consider most valuable. Mr. Rietz, an eminent electrician of Indianapolis, asserts that no current is constant and steady unless the plates are constantly in the fluid. The wonderful results being attained at the present time with electricity in treating fibroids, together with the similarity between hyperplasia and fibroids, lead me to think that electricity, used in the earlier stages of the former, would many times prevent the growth of the latter, and restore many enlarged, tender and displaced uteri to their normal conditions. Removal of the ovaries for the cure of subinvolution has been suggested. It was not my purpose, however, to speak of the surgical treatment of subinvolution, so much as to call attention to importance of obviating the necessity for surgical operations by removing those morbid pelvic conditions which tend to make such operations necessary.

Conclusions.—From the foregoing statements bearing on menstrual and post-partum subinvolution, I feel warranted in submitting the following questions for discussion:

1. Where does subinvolution end, or areolar hyperplasia become sufficiently circumscribed to receive the name interstitial fibroid?

2. Are not all varieties of fibroid tumors but localized conditions of more diffuse areolar hyperplasia?

3. Do not microscopists agree that the areolar hyperplasia of arrested involution and fibroid tumors both originate in uterine hyperæmia?

4. If this be true, does it not suggest that greater efforts to prevent uterine hyperæmia from resulting in hyperplasia, would also lessen the frequency of fibroid tumors?

5. Is not chronic areolar hyperplasia at the foundation of a large number of cases of diseased and displaced uteri and ovaries, and will not any means, medical or surgical, looking to a cure, which does not remove this abnormal tissue, fall short of the desired result?

6. Despite recent advances in gynecic surgery, is not blood, deficient in quantity and quality, as important a *primary* factor in the causation of uterine disease as when Holy Writ first declared, "The blood is the life thereof?"

7. So many new things are becoming old, I present this paper to aid some old things in becoming new, and for the purpose of calling attention to a few points in uterine pathology and therapeutics which, if less frequently forgotten by the average practitioner, would render operations for lacerations, diseased ovaries and other pelvic diseases much less frequent, and of more benefit to women when performed.

THE CHEMISTRY OF TYROTOXICON:

Its Action upon Lower Animals; and its Relation to the Summer Diarrhœas of Infancy.

Read in the Section on State Medicine, at the Thirty-Eighth Annual Meeting of the American Medical Association, June, 1887.

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Since making my report on the investigations concerning the nature of tyrotoxicon, (report of *Proceedings of the Michigan State Board of Health*, October, 1886), I have continued my work, aided greatly by Messrs. F. G. Novy and E. V. Riker. We soon ascertained that if some butyric acid ferment be prepared as is ordinarily done in the preparation of butyric acid, and some of this be added to normal milk, and the whole be kept in closely stoppered bottles for eight or ten days, the poison will be developed in the milk in considerable quantity. The milk should be filtered, the filtrate neutralized with sodium carbonate, and then extracted with ether.

Having a strong solution of the poison in absolute alcohol, which had been obtained from milk inoculated as stated above, I added to it some platinum chloride and began to evaporate on the water-bath. As soon as the alcohol evaporated the residue exploded with great violence. The vessel, a glass evaporating dish, was broken into fine fragments and these were scattered over the room; while the gas-light under the water-bath was extinguished. The experiment was repeated a number of times with like results. From some of this alcoholic solution the platinum was removed with hydrogen sulphide gas; but the filtrate was then found to have lost its explosive property. This reminded us that diazobenzol compounds form with platinum chloride a highly explosive compound, and that diazobenzol is also decomposed by hydrogen sulphide. Some diazobenzol nitrate was prepared according to the method of Griess,[1] and comparisons made between this and tyrotoxicon. With equal parts of sulphuric acid and carbolic acid the prepared diazobenzol

[1] Annalen der Chemie und Pharmacie, B. 137, S. 39.

nitrate gave a green coloration; while with the same reagents, tyrotoxicon gave a color which varied from a yellow to an orange-red. But the diazobenzol nitrate dissolved in the whey of normal milk, and extracted with ether or in the presence of other proteids, gave the same shades of color as the tyrotoxicon did, and the potassium compound of tyrotoxicon prepared by the method to be given later produced the same shade of green as did the artificial diazobenzol. This color test may be used as a preliminary test in examining milk for tyrotoxicon. It is best carried out as follows: Place on a clean porcelain surface two or three drops each of pure sulphuric acid and pure carbolic acid. This mixture should remain colorless or nearly so. Then add a few drops of the aqueous solution of the residue left after the spontaneous evaporation of the ether. If tyrotoxicon be present a yellow to an orange-red will be produced. This test is to be regarded as only a preliminary one; for it may be due to the presence of a nitrate or nitrite.[2] The tyrotoxicon must be purified according to a method to be given further on before the absence of nitrate or nitrite can be positively demonstrated.

In the filtrate from milk which is rich in tyrotoxicon, after neutralization with sodium carbonate, filtration and acidifying with hydrochloric acid, gold chloride produces a precipitate, which is insoluble in water; but soluble in hot alcohol, from which it separates on cooling in golden plates. Diazobenzol compounds give with gold chloride a precipitate having all these properties. In both cases the gold compound is decomposed by frequent treatment with hot alcohol, and this fact prevented any satisfactory ultimate analysis of this salt. It should be remarked here that from some samples of milk this gold salt is obtained much more easily than from others, and the difference is dependent not so much upon the amount of tyrotoxicon present, as upon the condition of the other organic matter present. It is best obtained from samples which have stood in well stoppered bottles for a month or longer. Tyrotoxicon obtained from milk was treated according to the method recommended by Griess[3] for the preparation of diazobenzol-potassium hydrate, and the per cent. of potassium in the compound obtained was determined. The filtrate from the milk which had been inoculated with the ferment and kept in a stoppered bottle in a warm room for 10 days, was neutralized with sodium carbonate, agitated with an equal volume of absolute ether, allowed to stand in a stoppered flask for 24 hours, the ether removed and allowed to evaporate from and open dish. The aqueous residue was acidified with nitric acid, then treated with an equal volume of a saturated solution of potassium hydrate and the whole concentrated on the water-bath. On being heated the mixture became yellowish-brown, and omitted a peculiar aromatic odor. Both the color and odor corresponded exactly with the color and odor produced by carrying some of the artificial diazobenzol through a comparative test. On cooling, the mass crystalized, the resulting compound appearing in the test with the tyrotoxicon, and in the comparative test also, in beautiful, six-sided plates, along with the prisms of potassium nitrate. The crystalline mass obtained from the tyrotoxicon was treated with absolute alcohol, filtered, the filtrate evaporated on the water-bath, the residue dissolved in absolute alcohol, from which it was precipitated in a white crystalline form with ether. The precipitate was collected, washed with ether, dried, and the per cent. of potassium estimated as potassium sulphate. .2045 gram of the substance yielded .109 gram of potassium sulphate. Per cent. of potassium calculated, in $C_6H_5N_2OK$ 24.42; found, 23.92. This analysis establishes the identity of tyrotoxicon and diazobenzol. Chemists will now appreciate the great difficulty that has been experienced in isolating the active agent of poisonous cheese.

The readiness with which diazobenzol decomposes is well known. When warmed with water it breaks up into carbolic acid and nitrogen. Hydrogen sulphide decomposes it; therefore, all attempts to obtain the poison by precipitating it with some base, such as mercury or lead, and then removing the base with hydrogen sulphide, have failed. Moreover, diazobenzol is only a transition product of putrefaction. I have frequently found that leaving some milk rich in the poison in an open beaker for 24 hours would be sufficient to destroy the whole of the poison. We know nothing positively concerning the acid with which diazobenzol is combined in the milk or cheese. We prepared some diazobenzol butyrate, $C_6H_5N_2C_4H_7O_2$, and ascertained that the crystals of this compound correspond with those of tyrotoxicon, and that they decompose in moist air with the same rapidity. This is the first time that diazobenzol has been found as a product of putrefaction, and it is possible that many of its allied compounds may be formed in the same way.

The following experiments will show that the effects of tyrotoxicon and diazobenzol upon the lower animals are identical.

Experiment 1.—From one-half gallon of some milk, which had stood in a tightly stoppered bottle for three months, there was obtained quite a concentrated aqueous solution of the poison after the spontaneous evaporation of the ether. Ten drops of this placed in the mouth of a small dog 3 weeks old caused within a few minutes frothing at the mouth, retching, the vomiting of frothy fluid, rapid breathing, muscular spasm over the abdomen, and after some time watery stools. The next day the dog seemed to have recovered partially, but was unable to retain any food. This condition continuing for two days, the animal was killed with chloroform. No examination of the stomach was made.

Experiment 2.—Tyrotoxicon obtained from poisonous ice-cream was given to a cat. Within ten minutes, the cat began to retch and soon it vomited. The retching and vomiting continued for 2 hours during which time the animal was under observation, and the next morning it was observed that the cat had passed several watery stools. After this,

[2] The coloration with nitrates and nitrites is darker than with diazobenzol; but before positive conclusions are arrived at other tests must be made.

[3] Annalen der Chemie und Pharmacie, B. 137, S. 54.

although the cat could walk about the room, it was unable to retain any food. Several times it was seen to lap a little milk, but on doing so it would immediately begin to retch and vomit. This condition continuing, after three days the animal was placed under ether, and its abdominal organs examined. We certainly expected to find marked inflammation of the stomach; but we really did find the stomach and small intestines filled with a frothy serous fluid, such as had formed the vomited matter, and the mucous membrane very white and soft. There was not the slightest redness anywhere along the alimentary canal.

Experiment 3.—Some tyrotoxicon obtained from milk which had been inoculated with poisonous cream and allowed to stand for 48 hours was administered to a large old cat. It soon produced retching, but no vomiting or diarrhœa. The amount of the poison administered in this case was small.

Experiment 4.—Some tyrotoxicon from milk was given to a young, but full grown cat. Within 15 minutes there was marked and evidently painful retching, and within half an hour vomiting accompanied by rapid breathing. Later there were several stools, the first two of which contained fæcal matter; but the subsequent ones were rice-water like and wholly free from fæcal odor. After two days some more of the poison was given, and the vomiting and diarrhœa again induced. The animal was then anæsthetized; and examination of the stomach and intestine showed the mucous membrane blanched as in experiment 2.

We have the records of a number of other experiments with tyrotoxicon on the lower animals; but as the symptoms induced in all were substantially the same, it is unnecessary to note them here. We will now give the effects observed in the lower animals after the use of the prepared diazobenzol.

Experiment 5.—Gave to a large old cat, 100 milligrams of diazobenzol butyrate. Immediately the animal began to purge. Then she lay upon the floor breathing rapidly and retching severely for two hours, when she died. The retching was most violent; but vomiting seemed impossible. Post mortem examination showed the lungs greatly congested, but the mucous membrane of the stomach and intestine was not reddened. The stomach contained some food. I suppose that the congestion of the lungs was due to the violent retching.

Experiment 6.—To a young but full grown Maltese cat, I gave 100 milligrams of diazobenzol butyrate. With most violent retching, but without either vomiting or stool, the animal died within 30 minutes after the administration of the poison. The lungs were found acutely congested, and the stomach free from any redness. The circular fibres of the small intestine were tightly contracted.

Experiment 7.—Gave to a full grown cat 25 milligrams of diazobenzol butyrate. Within 10 minutes vomiting and purging were induced. The first stools contained fæcal matter; but the subsequent ones were like rice-water, and wholly free from fæcal odor. After two days the cat was able to take food, then 10 milligrams more of the poison was given, with the reproduction of the vomiting and purging. The animal then rapidly emaciated, and after a few days, it was anæsthetized and the mucous membrane of the stomach and intestine found blanched. The lungs were not congested.

Experiment 8.—10 milligrams of the poison produced diarrhœa and continued vomiting in a cat.

Experiment 9.—75 milligrams produced vomiting and diarrhœa with congestion of the lungs in a dog.

It seems unnecessary to detail any more of these experiments, as the identity of tyrotoxicon with diazobenzol is now established, not only by chemical analysis, but this proof is strengthened, if chemical analysis can be strengthened, by the action of the poison on the lower animals and by post-mortem appearance.

I think it highly probable that diazobenzol or some closely allied substance will be found in all those foods, which from putrefactive changes produce nausea, vomiting and diarrhœa. In some oysters, which produced these symptoms, I have recently found tyrotoxicon.

Milk or other fluid to be tested for this poison should be kept in well stoppered bottles; for if the fluid be exposed to the air, the tyrotoxicon may decompose in a few hours. The filtrate from the milk or the filtered aqueous extract of cheese should be neutralized with sodium carbonate, then shaken with half its volume of pure ether. Time should be given for the complete separation of the ether. Purified tyrotoxicon is insoluble in ether, and it probably owes its solubility in ether at this stage to the presence of impurities. After complete separation the ether should be removed with a pipette and allowed to evaporate spontaneously from an open dish. The residue from the ether may be dissolved in distilled water and again extracted with ether; but repeated extractions with ether are to be avoided, for as the tyrotoxicon becomes purified, it becomes less soluble in ether. To a drop of an aqueous solution of the ether residue apply the preliminary test with sulphuric and carbolic acids. To the remainder of the aqueous solution of the ether residue add an equal volume of a saturated solution of caustic potash, and evaporate the mixture on the water-bath. The double hydrate of potassium and diazobenzol will be formed if tyrotoxicon be present, and this may be recognized by its properties and reactions which have already been described.

The above mentioned experiments upon the cats and dogs strengthen us in the belief that the development of this poison in milk is a frequent cause of cholera infantum and kindred affections. When we remember that these diseases are most prevalent among the poor classes of our large cities, where fresh milk is almost unknown, we can readily understand their frequency. By such people milk is often not obtained until it has begun to sour, then it is kept at a high temperature and often in a most foul atmosphere, and we all know something of the readiness with which milk takes up bad odors. This milk is then eaten by the little ones who are weakened by poverty and everything that poverty means, insufficient food generally, and that of the poorest

quality, insufficient clothing, insufficient and vitiated air. With these facts before us it is not surprising that in all our large cities thousands of children die annually from the summer diarrhœas. Moreover, in our country places, how little attention is given to the food of children, we all know from actual observation. Cows stand and are milked in filthy barns and yards. The udders are generally, so far as my observation goes, not washed before the milking; the vessels for the milk are frequently found not as clean as they should be. Then there are the thousands of children that must draw their sustenence from bottles, the cleansing of which is in many families not properly attended to. Crusts of decomposing milk form around the neck of the bottle, in the tube and nipple, lead to the rapid decomposition of the entire contents of the bottle. I think that one of the most important advantages to be secured to breast-fed children arises from the lessened danger of infection of the milk with germ which may produce poisonous ptomaines.

I would not claim that decomposed milk is the sole cause of the summer diarrhœas of children, nor would I claim that tyrotoxicon is the only poison that may be developed in milk. It is *only one of a large class of bodies which are produced* by putrefaction, and many of these are cathartic in action.

But will this knowledge concerning the development of poisons in milk and other foods aid us in the prevention and treatment of these diseases?

Preventive measures will consist for the most part in attention to the diet, and especially in milk. I have drawn up the following rules concerning the care of milk:

1. The cows should be healthy, and the milk of any animal which seems indisposed should not be mixed with that from the perfectly healthy animals.

2. Cows must not be fed upon swill, or the refuse of breweries, or glucose factories, or any other fermented food.

3. Cows must not be allowed to drink stagnant water; but must have free access to pure, fresh water.

4. Cows must not be heated or worried before being milked.

5. The pasture must be free from noxious weeds, and the barn and yard must be kept clean.

6. The udders should be washed, if at all dirty, before the milking.

7. The milk must be at once thoroughly cooled. This is best done by placing the milk can in a tank of cold spring water or ice-water, the water being of the same depth as the milk in the can. It would be well if the water in the tank could be kept flowing; indeed, this will be necessary unless ice-water is used. The tank should be thoroughly cleaned every day to prevent bad odors. The can should remain uncovered during the cooling, and the milk should be gently stirred. The temperature should be reduced to 60° F. within an hour. The can should remain in the cold water until ready for delivery.

8. In summer, when ready for delivery, the top should be placed on the can, and a cloth wet in cold water should be spread over the can, or refrigerator cans may be used. At no season should the milk be frozen; but no buyer should receive milk which has a temperature higher than 65° F.

9. After the milk has been received by the consumer, it should be kept in a perfectly clean place, free from dust, at a temperature not exceeding 60° F. Milk should not be allowed to stand uncovered, even for a short time, in sleeping or living rooms. In many of the better houses in the country and village, and occasionally in the cities, the drain from the refrigerator leads into a cesspool or kitchen drain. This is highly dangerous; there should be no connection between the refrigerator and any receptacle of filth.

10. The only vessels in which milk should be kept are tin, glass or porcelain. After using the vessel it should be scalded, and then, if possible, exposed to the air.

With the attention demanded by these rules given to milk, it will become more valuable as a food, and the development of poisons in it before its introduction into the body will certainly be prevented.

But in the prevention of the summer diarrhœas, attention to the food must not stop with its introduction into the body. The ferment which produces tyrotoxicon is widely distributed, and it only awaits conditions suitable for its development. We do not know exactly what germ it is that produces this poison; but it is either the butyric acid ferment or some ferment which is frequently developed along with the bacillus butyricus; because I have found that if some butyric acid ferment be prepared according to the method usually followed in making butyric acid, and milk be inoculated with this and allowed to stand at the temperature of the body for a few hours, or at the ordinary temperature of the room for several days, the poison will appear. Moreover, as is well-known, the bacillus butyricus grows best in the absence of air; we have already seen that the exclusion of air favors the development of tyrotoxicon. We are aware of the fact that the butyric acid ferment frequently does develop in the stomach. Therefore, I think that the prevention of these diseases necessitates some attention to digestion. If the food lies in the stomach or intestine undigested, putrefactive changes will occur there.

During the hot months, children, which are allowed to take food at will, often drink large quantities of milk simply for the purpose of quenching thirst. Especially is this true when the patient forgets that a child would sometimes relish a drink of good water. I feel that this overloading the stomach with milk caused by thirst often is of no little detriment. It is hardly necessary to specify in regard to other ways in which attention should be given to the digestive organs of children. Those that partake of other foods with their milk should be allowed only the most wholesome articles, and these should be in perfect condition. Moreover, the depressing effects of extreme heat on the nervous system and its consequent injury to digestion should always be borne in mind.

Now, we come to the discussion of the curative treatment of these diseases. The first thing to do is

to stop the administering of milk in any form. The ferment is present in the alimentary canal, and giving the best of milk would simply be supplying the germ with material for the manufacture of the poison. This no-milk treatment is not by any means a new idea. It has been taught for some years by a few of the best authorities; but it has not been sufficiently insisted upon. Moreover, the reason for it has not been hitherto understood. It was believed in somewhat of a vague way that the digestive organs lose their capability of digesting milk, and experience showed that the exclusion of milk led to improved results. But now that we know that a powerful poison is formed from the putrefaction of the milk, the necessity of its exclusion must become apparent to all. I reported last year a case which is so applicable here that I must be pardoned for quoting it in full. If the child had been an animal upon which I wished to experiment I could hardly have selected conditions more favorable:

"July 30, 1886, about 1 o'clock P.M., I was called to see the seven months' old babe of Mr. B. I found that the child had been vomiting quite constantly for some three hours. It had also passed watery stools some six or seven times. The eyes were sunken, skin cold and clammy, and pulse rapid and small. I diagnosticated cholera infantum. During the preceding night the child had seemed as well as usual, and had taken nourishment freely from the mother's breast. Early in the morning it had been given a bottle of cow's milk, and soon thereafter the nausea and vomiting began. Later, as stated above, the child began to purge. The mother, furnishing an insufficient supply of milk, it had been the habit to give the child cow's milk several times through the day. I prohibited the further use of milk, both that from the mother and from the bottle, and substituted meat preparations and rice water as food. I also prescribed pepsin, bismuth subnitrate, chalk mixture, and camphoreted tincture of opium.

"The cow's milk which had been furnished the child was from an animal kept by one of the neighbors. On the evening of the same day that the child was taken sick I obtained two quarts of the morning's milk of this animal. The milk had the appearance of very rich cream, being of a yellow tint throughout. This milk was allowed to stand through the night of the 30th in the ice-box of a refrigerator. On the morning of the 31st I began the analysis. After pouring the milk from the pitcher there remained in that vessel about two ounces of a fluid the color of port wine. Microscopical examination of this fluid showed the presence of pus and blood corpuscles. The blood was also detected by obtaining the characteristic bands of oxyhæmoglobine with the spectroscope. The milk, which had already coagulated, was filtered. The strongly acid filtrate was rendered feebly alkaline with potassium hydrate and then agitated with absolute ether. After separation the ether was removed with a pipette and allowed to evaporate spontaneously. This residue was dissolved in distilled water and again agitated with ether. This ethereal solution left, after spontaneous combustion, a residue which had a slightly brownish tint. I did not obtain the crystals of tyrotoxicon, doubtless owing to this trace of impurity; but the residue had the color and taste of tyrotoxicon. This residue dissolved in some distilled water and given to a cat produced retching and vomiting.

"That tyrotoxicon was present in the milk taken by the child shortly before the beginning of its illness there could now be no doubt. It is true that the milk was abnormal in other respects also, inasmuch as it contained pus and blood.

"After the withdrawal of all milk and the use of the medicinal agents mentioned above, the child began to improve, and by the afternoon of August 1 it seemed so well that it was allowed a bottle of cow's milk (from another animal); but soon after taking this milk it began to vomit and purge. Milk was again withheld and the same medicinal treatment resorted to. This attack was slight, and after it the child continued to improve until the night of August 4, when the grandmother, 'who knew more about raising babies than the doctor,' fed the child bountifully upon milk. Again the vomiting and purging began, and it was more than a week before all symptoms of gastro-intestinal irritation had disappeared. About the 15th of August milk was again allowed, at first in small quantity, and this seeming to have no harmful effect, more liberal quantities were given. The child has continued well since."

That my experience in this is not unique will be made evident by the following quotation from a recent paper by Dr. L. Emmet Holt, physician to the New York Infant Asylum, who writes as follows: "In children under two years of age not fed at the breast, it is better to withhold milk entirely. This has been a subject of careful investigation during the past summer at the New York Infant Asylum, and both the resident physicians and myself have had this proved to our satisfaction by a large number of cases. Peptonized milk is very much less likely to disagree than either condensed milk or fresh cow's milk. But in many, even this caused an aggravation in the intestinal symptoms, particularly in severe and protracted cases. Again and again have I seen relapses brought on when milk was added to the diet in cases where the stool had been practically normal for two or three days."

The food used may consist of chicken and mutton broths, beef juice, and rice or barley water. With this list, no difficulty will be experienced in giving the child sufficient nourishment. In the medicinal treatment the first thing to do is to cleanse the alimentary tract as thoroughly as possible. In the first stages of the disease there is no better agent for this purpose than castor oil. But if there have already been several serous discharges, copious enemata of water will be more suitable. These injections may contain either an astringent or a disinfectant, or both. For the latter, Holt recommends benzoate or salicylate of sodium, and for the former, nitrate of silver or tannic acid.

The next thing to be done is to arrest the growth of the germ. This germ has been found so far to develop only in acid media. Therefore, I think it wise to administer some antacid. Probably there is

nothing better in this line than the old chalk mixture. In the preparation of the chalk mixture, the druggist should be requested to use glycerine, as many druggists still use syrup in this preparation. The presence of the sugar leads to rapid decomposition during hot weather. It has been said that the use of the antacid is irrational, because the discharges are often alkaline. Of course, the serous discharges are often alkaline, because they consist of blood serum, and will be alkaline unless they have remained in the intestine long enough to ferment; but the reaction of such discharges does not prove that the contents of the stomach and small intestines are alkaline.

As to the use of germicides, doubtless much is yet to be learned. No doubt the chief effect of subnitrate of bismuth in this disease has been due to its effect upon the germ. Holt makes an excellent showing for the salicylate of sodium; but since he has been using this drug, he has followed the no-milk diet and doubtlessly his lessened mortality has been due to the exclusion of milk quite as much as to the salicylate. He uses this drug in doses of from one to three grains every two hours.

I am now making some experiments with the object of ascertaining the effect of certain germicides on the development of this poison. The results, I will give in some future paper, but I may state here what my success has been in a few experiments with mercuric chloride. The method of conducting the experiment was as follows: Four-ounce bottles were filled with milk, milk and ferment, and milk and ferment with mercuric chloride, closed with glass stoppers and kept in an air-bath at the temperature of the body for six hours. Then the milk was tested for tyrotoxicon with the following results:

No. 1. Bottle containing pure milk only. Result, no poison.

No. 2. Bottle containing pure milk only. Result, no poison.

No. 3. Bottle containing milk and ferment. Result, the poison present.

No. 4. Bottle containing milk and ferment. Result, the poison present.

No. 5. Bottle containing milk, ferment and a one-hundredth grain mercuric chloride. Result, poison present.

No. 6. Bottle containing milk, ferment, and one-fiftieth grain mercuric chloride. Result, poison present.

DISCUSSION.

DR. J. M. ALLEN, of Liberty, Mo., said that there was no evidence of inflammation after the diarrhœa from tyrotoxicon. This is rare, for inflammation generally exists. Milk alone is not the cause of summer complaint in children. In the country not only is good milk obtained but, moreover, most country children are nursed by the mother. Reflex irritation should be borne in mind as a cause. Very rapid changes are going on in the gastro-intestinal canal of the growing child and we have excitability *plus* reflex action. There is first arrested digestion in the stomach. The secretion of the stomach is first interfered with, followed by fermentation of the food, by hyperæmia, and a state of inflammation. He directed his attention to controlling reflex irritation and to the food.

DR. VAUGHAN said: I doubt that there is active congestion in severe cases of cholera infantum. The mucous membrane is bleached and whitened. Tyrotoxicon acts by increasing reflex excitability, and not so much by irritation.

DIARRHŒA INFANTUM AND ALLIED DISORDERS.

Read in Section on Diseases of Children, at the Thirty-Eighth Annual Meeting of the American Medical Association.

BY GEO. WHEELER JONES., M.D.,
OF DANVILLE, ILL.

At the close of the last meeting of the Association, held in St. Louis, I promised Dr. Miller, the Chairman-elect of this Section, to write a short paper on this subject, which had been pressing itself upon my mind for several years, and with growing force since the discussion in the Academy of Medicine, of Paris, of Gautier's paper on the result of the very important—not to say startling—investigations of Selmi in 1877, including much original matter as presented by himself. Continued researches in this direction have only confirmed the principles enunciated by earlier workers. The discovery of tyrotoxicon by Prof. Vaughan, with the increasing number of suggestive cases and reports, seemed to me to justify the contribution I proposed to offer to this Section. Since commencing the preparation of this paper Dr. Emmet Holt has given us a valuable article on the same subject published in the New York *Medical Journal* of the current year.

It is now more than a quarter of a century since I sat at the feet of our professional Gamaliel and listened to his views upon the causes of summer disorders in children. Ptomaines and leucomaines were the undiscovered quantities, but the environment necessary for their suitable abode, and the circumstances necessary for their full development will never be more clearly described than I have heard in words from the lips of Prof. N. S. Davis; while the treatment instituted to control the diseases pointed—as we now see—unerringly toward the discoveries and advancements of the near future, although the conservatism of his own mode of thought may have prevented him from fully consenting to much that the modern enthusiast claims as undoubted fact and axiomatic principle. Under the teachings referred to I had grown to a full realization of the importance of heat as a factor in the production of intestinal disorders, but in the care of a regiment during the war—in an active service from the Mississippi to the Atlantic seaboard I learned rapidly to know that heat was only *one* of the elements to be combatted. The commands of which I had charge were rather exceptional in healthfulness and a recent review of the prescriptions and advice which it was my custom to give show that I was unconsciously aiming my medical guns at micro-organisms in the use of germicides rather than at the patient in the use of opiates and astringents. I merely mention this as a suggestion, for the principles involved are the same be the children 30 days or 30 years old.

Entering upon an active practice at the close of the war, I early became dissatisfied with the routine treatment of summer disorders in children, losing important cases during successive years and upon the promulgation of the germ theory of disease, I eagerly investigated the same, accepted it as a probably satisfactory solution of the difficulties in the way of greater triumphs in the saving of our babies' lives. Treatment based upon such acceptance proved wonderfully successful, as recorded in a paper which I read before the Illinois State Medical Society several years since. Every season and every new case has only confirmed me in the correctness of the position now taken by many of our best investigators until it might almost be laid aside with the remark "it goes without saying;" but for the other fact that only the few have a full realization of these things, and settled truths are only rendered potent in a large way by persistent reiteration, and a presentation from standpoints as varied as are the characteristics of human observers.

Whether putrescence has its origin in hydrolytic action with the necessary agitation to the elective affinities, or in the deoxydizing power of micro-organisms the result is the same—and in the light of recent investigations we must look to these results for much that is the cause of disordered vital actions in the various derangements of the intestinal canal. Older men, imbued with the earlier teachings, especially those who grasped at chemical action as the solution of the problems of biological research, will long hesitate to adopt the lines of thought which lean towards the former view; only the most painstaking exactitude and the most positive proof from the thoroughly informed bacteriologist will be convincing, and even then the verdict may be the Scotch one with a truce to theory while practice shall follow the lead of the other side. For my own part I am fully impressed with the capability of the micro-organic theory of certain diseases to satisfactorily account for more of their peculiarities than any other view that has thus far been advanced, and in a successful combat with the diseases considered in this paper, I believe there will be found no more efficient means than such as will develop from a thorough knowledge of all those conditions which make toward the possibilities of micro-organic development. And for this very reason the recent review of the whole subject as necessitated by the presentation of Gautier's views before the Académie de Médecine has been productive of the most positive advance as yet made toward a fuller and more satisfactory consideration of the subject of bacteriology in its relation to doctors and disease.

All putrefaction—all fermentation—is an accompaniment, if not a consequence of cell action and cell formation, *i. e.*, of cell life, the various processes having each its respective form of cell and cell growth as the basis of its incubation and continuance. Whether the newly-discovered factors in disease—the ptomaine products—are a result of cell disintegration is a sharply defined field for future research; that it may be the latter and that the term cadaver alkaloids bears a doubly potent significance there are many reasons for believing. The action of one of these alkaloids within the system is prompt, and unvarying, awaiting no slow process of incubation and maturity. Tyrotoxicon produces in a few moments all the most virulent symptoms of cholera infantum or milk poisoning, while an alkaloid from the culture fluid of the comma bacillus gives origin at once to typical Asiatic cholera, so far as the morbid phenomena can determine.

And just here I will throw out the suggestion as to whether inoculation with, or ingestion of high attenuations of some special alkaloid might not prove a valuable prophylactic in the management of some one or more of the dreadful diseases to which it bears an apparent causative relation, this suggestion of course being founded upon a consideration of the processes promulgated by Jenner and Pasteur, the half-acknowledged success of Ferran in Spain seeming to point towards such a possibility. All waste products, as is well-known, may be poisonous—probably are under certain conditions of heat, moisture and organic life. The idea of life is inconsistent without its accompanying thought of waste, be that life the micro or the mammal, and in that waste, be it from the vital activities of bone, muscle, nerve, or the active vitality of micro-organisms within the body, there exists destructive potentialities against which the skill of man was naught until the present generation. The life history of many of the ferments is only superficially known and the results of their existence obscure and intangible, but with some we are becoming quite well acquainted, and our near approach, we trust, will rob them of many terrors to our race.

A localized epidemic consisting of frightful morbid phenomena raises at once the question as to the domestic supplies, food, drink, air, clothing, by some one of which—closely questioned in turn—the sources of the trouble are revealed, may be corrected and the further spread of danger thus averted; no appeal to incantations, no guess work, no supineness, the foe is being sought for in his abiding place and destroyed.

There are many changes, structural and nervous, in food poisonings which are not accounted for upon the simple germ theories but which may be fully explained by referring their causes to the action of the cadaveric alkaloids in part or *in extenso*. Many of these products have the physical organization and the special physiological action of the various vegetable alkaloids as strychnine, narceine, coniine, etc., and in their toxic action will develop structural tissue changes which it is important to consider in arranging for the proper application of suitable remedies. In an extensive burn we have the fire to remove, the pain and shock to overcome, and the destroyed tissue to cleanse and restore—three distinct stages and modes of action, each calling for its special line of care. A return to this thought will occur in its proper place, when we are considering the question of treatment.

As ptomaines may be elaborated wherever organized ferments flourish, and as they represent the chief toxic principles of decomposing albumenoids, said decomposition resulting from the action of cell life, which action tends normally to constantly reproduce

itself so long as proper material is obtained, and thus continue the morbid processes once set in motion, and as many of the ptomaines in the waste of various diseases, producing by their continued formation a continuation of the morbid condition in which they are found, it really seems to me that their relationship to disease *must* be considered in all cases in which said disease is caused by or associated with micro-organic life.

Without entering into an elaboration of this branch of my subject which you will find has been accomplished by several far more capable and better prepared investigators, I shall proceed to offer to you some practical points for the general worker in medicine. I believe that the true solution of the difficulties in the way of the practical physician will be obtained by a union of the two theories which, when first presented in antagonism by M. Gautier, seemed to be utterly irreconcilable. Remembering the suggestions—as the existing knowledge was rapidly reviewed, that the alkaloid depends upon cell decomposition for its own possibility, and that no germ life can exist without death and decay—you have the key to the thought to which I desire to direct your minds.

Under ordinary circumstances the digestive organs are capable of overcoming a certain amount of fermentative change which may have taken place in the food ingested, in fact many an adult stomach seems to prefer a tainted meat to one too fresh, but I believe this arises largely from force of habit and from the fact that in most if not all such cases we find the germ destroyed and further change prevented in that direction by the indulgence in copious potations of strong alcoholic liquids than which there are few better germicides. The processes of digestion also tend to destroy germ life, except in those instances in which the cell has a special adaptation to intestinal abode. The liver products are powerful anti-ferments in a normal condition, and one of the most favorable symptoms in the treatment of the troubles under consideration is a copious discharge of bile into the intestinal canal, giving an almost invariable relief to all serious indications. While emptying an engorged liver may have the effect of relieving a local complication, I believe its greater influence is manifest in a disinfection of the gut and a consequent suppression of the causes of further infection.

In children the tissues are less able to resist the attack of morbific agents and nature makes an effort at compensation by making their livers much larger in proportion than they are in adults and, as a rule, if a child's bowel can be promply emptied and then washed with bile it speedily recovers from an ordinary intestinal derangement. In what are known as the offensive diarrhœas of children, there is always an absence of bile or the product is of a vitiated and deranged character. When from any cause the digestive processes become abnormal and the various secretions associated therewith become changed, and their varied components lightly held together the introduction of an external cause of further disintegration produces changes often of a rapid and resistless type. A few days and nights with the thermometer in the nineties gives an impulse to putrefactive processes wherever devitalized tissue, a cell and a trace of moisture are brought together, and that, as we all know, is everywhere wherever humanity may congregate. The same atmospheric condition permits an exaltation of body temperature in the child through its lack of tonic influence upon the trophic centres and peripheral surfaces by which the tissues—superheated through the rapid building changes of child life—are strained to the utmost tension in the effort of resistance against the potencies tending to excessive disintegration, a tendency which makes the secondary results of micro-organic attacks so often disastrous.

The train of symptoms once inaugurated you too well know to have them reviewed at this time. The introduction of a microbe of fermentation or putrefaction into the intestinal canal under such favorable circumstances is only the first step—and these germs are everywhere as suggested before. The instinct of a child to put everything into its mouth leads the way to infection from a hundred unsuspected sources, and only the most extreme watchfulness and cleanliness in everything can avert the threatened danger. The child at the breast has dangers in general to fear, with the special liability of the mother to inaugurate changes in her milk from the influences of disease, overwork, menstruation and the various disturbing passions of mind and body, but its dangers are trifling compared with the child that is carelessly fed from the bottle, the slop jar, the table and the street.

Prof. Vaughan has said in his modest way "cholera infantum and summer diarrhœa *may* be due to the action of tyrotoxicon produced by fementation in milk foods." I believe that a large proportion of such cases are so caused—far more than has been heretofore realized, and that most of the remainder may be traced to other sources of micro-organic life. The amount of traumatic or local inflammation from other causes in children are few indeed. The first ingestion of the food poison is of course met by a prompt effort to expel the same by emesis and purging where the amount is at all great—and if the effort is successful a few doses of the bromides or other nervous sedative is the only remedy needed. Going a little further—a retention of a few cells in the folds of the intestines establishes a breeding ground for a continuance of the trouble, while the action of the special alkaloid upon the epithelial tissues tends to produce disintegration therein, and in its turn adds fuel to the fires only half spent. Where the quantity of poison ingested is large the structure involved is often so great as to produce the most extreme shock with inability to recover. When it is small a slower course is pursued and a more general involvement is manifest—the case drifting into the ranges of subacute and chronic forms.

In the special management of these disorders, my own course will probably best illustrate my views. If called to see a child in the first symptoms of the first stage, while active vomiting is still present, or if from any cause I suspect the stomach contains any material, I give a prompt emetic, and I have never found anything better than a few grains of ipecac in a strong solution of chloride of sodium—the former

I always have in my pocket, and the latter, a powerful antiseptic and germicide, is found in every pantry, promptly following this with whatever antiseptic remedy of a pleasant taste and harmless action I find most convenient, some aromatic and sedative powder or solution, and minute doses of mild chloride of mercury, perhaps, for a few doses, especially if the discharges are putty-like and offensive, to be accompanied and followed the second or third day, if the case is not promptly restored, by very small doses of the bichloride in solution. The persistent application of the warm pack to the body—to the water of which mustard or other irritant may be added—will be found an excellent adjuvant.

If a stimulant seems called for the aromatic spirits of ammonia will prove efficient, and good brandy or aromatized whiskey may be given, but never wines or other fermented liquors, until the stage of convalescence is fully established, and then no stimulant is called for. During the active period of the disease all milk and forms of milk food are withheld, because of the fact that the poisons within the body, along with the subnormal status of digestion, promptly taints such foods and make them only an additional source of irritation. I am in the habit of withholding for awhile almost all foods as such, and giving some one of the numerous forms of nutrient tonics in minute doses. One of the best of these is Phillips' "Syrup of Wheat Phosphates." The disorder in early stages is one which will bear much starving, as the rest to the digestive organs is invaluable.

I rely upon no special remedy or combination of remedies. Nature—our very best guide when we get acquainted with her—has provided innumerable means for combating these dangers, and it seems to be our chief duty to select that formula, in a given case, which will prove the most efficient, and which is the most readily tolerated. The bichloride I do not give at first, because of its tendency to nauseate, and it has seemed to me to be better adapted to the second stage, when the tissues were softened and inclined to break down in putrefactive changes, *i. e.*, it is better adapted to overcome and avert the consequences of ptomaine action, than as a direct germicide—for which latter purpose the sulpho-carbolates and the aromatic antiseptics, with mild antacids, are more easily borne and equally efficient.

The solution of hydrastis and bismuth is an elegant remedy from which I have obtained fine results, especially in combination with "listerine," which is a compound of several pleasant vegetable antiseptics with boraco-benzoic acid. Resorcin is bitter, naphthalin is vile, and the salicylates very unpleasant—at least such is my experience and observation.

Anisic acid—an elegant article—iodine, tannic acid,the turpentines, ergot, hamamelis, arsenic, camphor, chloral, opium, belladonna, quinine, etc., etc., all have their uses and their places in various formulæ, to suit the convenience or fancy of the physician or the idiosyncrasy of the patient. Anisic acid seems especially adapted to cases in which there is a great accumulation of gases in the intestines, and an irritable condition of the muscular coats.

Tannic acid is particularly indicated in dysenteric types and those cases where there is a remarkably softened condition of mucous membrane with hæmorrhagic symptoms. It surely has an action apart from its chemico-mechanical functions, as we may infer from its remarkable potency in overcoming the toxic effect of digitalis poisoning, and from the almost absolute freedom from cholera infection of those who use it largely in their special pursuits. Given as tannate of quinine we have a remedy in the cases under consideration of easy availability and positive power.

Hamamelis is another valuable remedy of which we know too little in actual practice. As a local means of relief when there is great tenderness and undue relaxation of the rectum, I have obtained excellent effects from an enema of a combination of tannin, conct. ext. witch hazel, ergot and morphine in starch water after each evacuation from the bowels.

Ergotin is a reliable drug for steadying the nervous system, when we find the vaso-motor and ganglia are losing tone and weakening in duty.

Opium should be used with the most extreme caution and watchfulness, only seeking when we do use it to obtain its sedative and tonic effects.

As to the other remedies mentioned, their proper positions in the line of management will readily suggest themselves to the thoughtful physician.

I would only urge, in conclusion, that whatever special remedies or particular formulæ may be adopted, give everything in the smallest doses practicable and frequently repeated. A minute but tangible dose of a well selected remedy, prepared in pleasant form and given every few minutes until its power is manifest, in these disorders of children, will generally succeed where larger doses at longer intervals will prove unavailing. The causes of this are easily understood by those who care to seek therefor. The theory is sound for the practice which we recommend—a practice which we know to be successful.

FOREIGN BODIES IN THE AIR PASSAGES.

BY D. LACOUNT, M.D.,

OF CHILTON, WISCONSIN.

I report these cases of foreign bodies in the air passages for the reason that I believe there are many cases in which foreign substances have entered the air passage and produced death either within a few hours or after prolonged suffering, with destruction of one or both lungs accompanied by symptoms closely allied to tuberculosis of the lungs, without any suspicion on the part of the attending physician as to the true cause of the disease while the patient lives. Where a foreign body is suspected the post-mortem examination is resorted to, and finding the foreign substance clears up the doubt. Parents are often unaware of the fact that a child has drawn a foreign substance into the trachea, and the attending physician is left to wander in the dark as to the cause of the attack under consideration. A careful examination of the chest should be instituted where a foreign body is suspected and if such substance be found it will modify the subsequent treatment, and

take a great load from the physician's mind. The following case illustrates this:

Case 1.—H. S., æt. 4 years, on August 3, 1876, while sitting upon the floor playing with some beans and having some in his mouth, became frightened by my presence (I having stepped in to visit another child having an attack of the measles) and in the act of crying, as is supposed, drew one of the beans into its trachea. The child continued to cry for a short time and had a mild fit of coughing, but no dyspnœa. I left the house not thinking there was anything the matter with the child, to be called back to see him in the course of one hour, finding him with a high fever. I made an examination of the chest, at this time I did not suspect a foreign body in the trachea, and found the left bronchus plugged so that very little air was admitted. It is very unusual for the foreign body to enter the left bronchus. In a large majority of cases, the right bronchus is the favorite locality, as is well-known, owing to certain anatomical peculiarities. In this case, however, the foreign body had entered the left bronchus, producing a severe attack of pneumonia of the left lung which lasted ten or twelve days, and then gradually or partially subsided, and assumed a chronic form. The patient became emaciated, had a cough, spasmodic in character, without expectoration, (the patient being too young to expectorate) and in fact all the symptoms of pulmonary tuberculosis, which at the end of six months ended in death. The patient at the time of his death was sitting upon the floor playing, and in the act of coughing became asphyxiated and died. Twelve hours after death I made an autopsy, and found on removing the sternum and costal pleura, an intense congestion of the outer surface of the left lung, with an accumulation of pus in the chest cavity. The costal pleura was intensely injected. In the upper lobe of the lung an abscess had formed of large size, and bursting had discharged its contents into the cavity of the chest. In making an incision through the center of the lung, there were discovered numerous small or diffused abscesses. On laying open the bronchi, I found the bean at the bifurcation all intact, but somewhat softened and enlarged, lying transversely plugging up both bronchi, causing death immediately. The original position of the bean was in the left bronchus, and in the act of strangling it was dislodged from its situation and lodged at the bifurcation.

Not being positive as to their being a foreign body in the air-passage, the treatment was to combat the pneumonia, although somewhat apprehensive as to the real cause. Under the circumstances in which I was placed, having a case of measles in the same house, and this child was expected likewise to be afflicted, it threw me off my guard and led me to think it might be the onset of an attack of that disease. Of course, the onset was too abrupt, but still it left my mind unsettled as to the cause of the disease. The patient not being asphyxiated at the time of swallowing the bean, and no severe symptoms presenting themselves and the parents not knowing positively that a foreign body had entered the air passage, if the surgeon had diagnosticated the case and was quite certain as to there being a foreign body in the bronchi, it would have been impossible for him to gain the consent of the parents to an operation. It has been my experience that people will not consent to an operation until it is too late for it to prove successful and the patient is lost.

Case 2.—H. M., æt. 3 years and 4 months, while playing in a garret with another child swallowed a bean. On the return of the parents, at 1 o'clock P.M., they found the child coughing violently, and on questioning him disclosed the above fact. The parents not being very intelligent did not suspect any serious trouble until the patient's cough increased and was attended with considerable dyspnœa. The child gradually grew worse until 11 o'clock A.M. of the next day, when he expired. I was called, but did not arrive in time to see the patient alive. One hour after death I made a post-mortem examination and found a bean well packed in the right bronchus.

Now in *Case 1*, the foreign body was found at the bifurcation, but it had evidently been in the left bronchus for it could not have remained for six months where it was found. At the examination, it was clear that the bean had located itself well down in the left bronchus, and in the act of coughing, just before death, was dislodged, carried to the bifurcation and immediately caused suffocation. The foreign body being the same substance in both cases it is singular that the symptoms were so different, one terminating in death after six months, the other in from eighteen to twenty hours. I am led to believe by this that a foreign body entering the left bronchus does not cause death so soon as when it lodges in the right. The right lung being somewhat larger than the left there is more breathing surface left for the patient, although it would seem that this difference in size would not be sufficient to prolong a patient's life for six months. I remember having a patient thirty years ago, an adult, who had received a gun-shot wound in the left lung, lower lobe. Inflammation set in, terminating in abscess, and the whole lung broke down into pus, except a small portion along the middle line, filling the left thoracic cavity, in other words, empyema. Paracentesis thoracis was performed and a great amount of pus was discharged, and continued to discharge up to the time of his death, which occurred two months later. Twelve hours after death I made an autopsy, and found only a small portion of the lung remaining, about the size of a man's hand. This patient must have lived at least four months without any use of his left lung. He died six months after receiving the gun-shot wound.

Case 3.—M. J., æt. 4 years, on March 14, 1885, while having carpet tacks in her mouth, one was drawn into the windpipe causing a severe fit of coughing, but no great dyspnœa. She informed her parents of what had happened, and was immediately brought to my office. On examination of the chest I came to the conclusion that the foreign body was in the right bronchus from the feeble respiratory murmur and a peculiar bronchial wheezing located just under the articulation of the second costal cartilage with its rib. Emetics had been administered before coming

to me, also slapping on the back had been tried, but to no purpose. Seeing no immediate danger unless it was from an attack of pneumonia, I advised the parents to make no further attempt to procure the foreign body. In all probability the foreign substance would soon be expelled by coughing.

After leaving my office they accidentally met a medical student from the College of Physicians and Surgeons, of Chicago, who recommended them to proceed immediately to the College, where one of the surgeons in attendance would perform tracheotomy and remove the tack. His advice was accepted, and on arriving at the College, the patient was examined by Professors St. John and McWilliams. They came to the same conclusion, that as long as the patient was not in any immediate danger, they would refrain from operating and take the chances that sometime the foreign body would be expelled by coughing. About a week or ten days after the patient returned home she was attacked with measles which ran its course in the usual time. The disease was accompanied with severe bronchial irritation, and in one of the paroxysms of coughing the foreign body was expelled just four weeks from the time it entered the trachea and the patient recovered perfect health.

Case 4.—F. R., æt. 7 years, in July, 1885, while having the upper half of a sixpenny nail in his mouth swallowed it, and it passed into the trachea. He immediately began to cough. His mother, however, did not believe that the nail had entered the windpipe. One week after the accident I was called, and found the patient laboring under a severe attack of pneumonia of the right lung, which ran its course in ten days and an effort was made toward convalescence. During the pneumonic attack there was slight cough which soon subsided; the patient, however, remaining quite weak and feeble. Four weeks from the day the foreign body entered the trachea, he had a severe paroxysm of coughing which lasted one hour, during which the foreign body was thrown out. The child began to improve immediately and was soon in perfect health.

In this case I think the foreign body was in the right bronchus. I could not tell positively, for the reason that the pneumonic symptoms masked all others. In all these cases it was not positively known that foreign bodies had entered the air-passage, therefore no operation was performed for the relief of the patients. In my opinion the mortality would have been greater if they had been operated upon. According to statistics, in 75 cases without operation 70, or 93.33 per cent. recovered, and 5 or 6.66 per cent. died. Of 34 cases in which bronchotomy was practiced 26, or 76.47 per cent. recovered and 8, or 23.53 per cent. died, a death rate 16.87 per cent. greater than in cases without operation.

MEDICAL PROGRESS.

Salol in Acute Articular Rheumatism and Acute Febrile Diseases.—Salol was discovered by Professor von Nencki in Berne some years ago, but has hitherto been little used as a medicine. Sahli, of Berne, has recently recommended it strongly for the treatment particularly of acute articular rheumatism and acute infectious diseases. Herrlich, after thoroughly testing it, is convinced of its value. In salol there is an ether combination of 60 per cent. of salicylic acid and 40 per cent. carbolic acid. It is salicylic phenol ether. It is a white crystalline powder with an agreeable, slightly aromatic odor. Its taste is bitter. Salol bears a resemblance to fats as regards both its chemical composition and its physical properties. Like fat, it cannot be dissolved in water, but is easily soluble in alcohol, ether, and in volatile and fat oils. It possesses pronounced antiseptic qualities; equal, according to Nencki and Sieber, to those of salicylic acid. It prevents the development of putrefactive germs, and meat can be kept by it for an unlimited time. But it does not act to any considerable extent as a disinfectant, like sublimate. Applied outwardly as a powder it is a powerful antiseptic, and being insoluble, it does not irritate the skin, as its component parts salicylic acid and carbolic acid do. One drawback is that, owing to its pliant nature, it is difficult to bring it into the form of a powder. Sahli recommends the use of sugar of milk in its pulverization. Taken internally it is resolved, according to Nencki, into salicylic acid and carbolic acid by the action of the pancreas ferment. Thus salol passes through the stomach unchanged, without particularly inconveniencing it, and only in the upper part of the small intestine, when it comes in contact with the pancreas ferment, does it fall into its component parts. The mucous membrane of the small intestine absorbs the two acids so quickly that, soon after 2 grams of salol have been given, the two acids are traceable in the urine as salicyluric acid or phenol-ether-sulphuric acid. The urine becomes of a greenish black or deep black color. It is remarkable that while this symptom would, in connection with the surgical application of carbolic acid, indicate poisoning, it has no significance after the internal application of salol. The dose recommended by Sahli is from 6 to 8 grams a day.

The interest of the internal application of salol is chiefly connected with its carbolic factor. What has been impossible is now feasible, viz.: to introduce with ease and safety large doses of carbolic acid into the body.

Sahli has published a report in which he states that with salol acute articular rheumatism has been treated with the most favorable results, that its effect on endocarditic complications has been very good, and that it alleviates the pain of chronic articular rheumatism. The only bad secondary effect mentioned by Sahli is tinnitus aurium. Salol can be given only in form of a powder, the single dose being up to about 2 grams. The powder is given in a wafer, or perhaps more easily in compressed tablets. Herrlich treated more than thirty cases of acute articular rheumatism with salol, and in addition a number of chronic cases and some typical cases of muscular rheumatism, lumbago, and omalgia. Acute articular rheumatism is very

favorably affected by salol and cured. The effect on chronic articular rheumatism and muscular rheumatism is palliative. Herrlich cannot determine how much of the anti-rheumatic effect is due to the carbolic acid. In the treatment of articular rheumatism, salol agrees with the patients if their general health is good, and has few bad secondary effects. but it cannot prevent relapse, nor has it any apparent favorable effect on endocarditic complications. Among his cases was one of a girl, 9 years of age, with acute severe feverish articular rheumatism. He gave daily from 3 to 4 grams of salol in single doses of 0.5 grams. The articular symptoms disappeared as if by magic. But already in the first few days, as is so frequently the case with children, endocarditic complications appeared which in three months led to complete mitral insufficiency. In a week there was the first recurrence of articular symptoms, which yielded promptly to salol. The came another relapse which, by way of comparison, he treated with antipyrin, which did not prevent a further relapse. The case was still under treatment.

Herrlich has found that feverish articular rheumatism is particularly favorably influenced by salol. This seems to agree with the action of anti-rheumatic remedies generally. Herrlich treated with salol eight cases of typhoid, some cases of puerperal fever of the protracted pyæmic form, three cases of genuine pneumonia, two cases of ulcerative endocarditis, and one fatal case of diphtheria. The stronger the general condition of the patient, the better was the effect of the salol. Its antipyretic effect is fairly certain, and apyrexy is on the whole free from inconveniences, perspiration being also moderate. No collapse of temperature was observed. Herrlich found the disturbances of the stomach to be the most serious drawback in the use of salol in the case of weak typhoid patients, there being præcordial oppression, distension, and nausea, and in some cases vomiting and loss of appetite. But in most cases the medicine agreed well with the patient. There was one case of real carbolic acid poisoning in a woman suffering from chronic articular rheumatism, who had taken 24 grams of salol in three days—on the third day 10 grams. She had violent vomiting, long-continued loss of appetite, and general depression, from which, however, she recovered in a few days. There was also a high degree of dysuria and tension of the bladder, with profuse urine containing much phenol.

Shivering, which follows modern antipyretics, is sometimes observed after salol. One typhoid patient suffered from it nearly always when the effect of the salol was ceasing, the temperature rising rapidly. But this does not occur much more frequently than in the antipyrin treatment.—*The London Medical Record*, July 15, 1887.

VILLOUS PAPILLOMA OF THE BLADDER REMOVED BY SUPRAPUBIC CYSTOTOMY.—E. D. PAOLI reports the second case of this kind in Italy. The first, operated on by Marcacci, died. Paoli's case was that of a woman, æt. 47, who had had symptoms for 7 years. The tumor could be felt through the dilated urethra, but was inacessible by the spoon, being at the vertex vesicæ. Suprapubic cystotomy was performed, and the tumor easily reached. The bleeding insertion was tamponed with liquor ferri temporarily; after hæmorrhage was arrested the bladder and skin were sutured in the upper two-thirds, and a drainage-tube and iodoform gauze placed in the lower third. On account of insufficient distension of the bladder the peritoneum reached to the symphysis, and had to be pushed back. Permanent catheter. Transient fever on 16th day, with some fetid urine. The patient recovered in a little more than one month. The tumor was a simple papilloma.—*Centralbl. für Chirurgie*, No. 20, 1887.

TRANSPLANTATION OF TENDON.—PEYROT reports the case of a 14-year old boy who had had both flexor tendons of the middle finger cut, and after that the finger could only be flexed slightly with half of the interosseous. The ends of the divided tendons were about 4 cm. apart. Peyrot united them with small pieces of tendon taken from a young dog at the time, and fixed the pieces with catgut. While the wound in the skin did not heal by primary union, the pieces of transplanted tendon healed in. On account of adhesions with the cutaneous cicatrix movement was not complete, but was very much better than before the operation.—*Centralbl. für Chirurgie*, No. 20, 1887.

DIAGNOSIS OF BEGINNING CARCINOMA OF THE CERVIX.—Since experience has shown that beginning carcinoma of the cervix can be entirely cured by operation, it is important that family physicians send the patients to the specialist early. And in order to make at least a probable diagnosis without microscopic examination of an excised piece, C. H. STRATZ says that from his observation and that of others the important signs of carcinoma are as follows:

1. The diseased place is sharply limited by sound tissue, and never goes over into it by degrees.

2. A difference in the level of the whole diseased portion can always be made out.

3. Carcinomatous portions have always a light yellow color.

4. The malignant deposit is usually shown as finely granular, whitish-yellow glistening elevations, at least in individual places.—*Centralbl. für Chirurgie*, No. 25, 1887.

TREATMENT OF SCABIES.—FOURNIER advises:

1. A thorough soaping of the parts, followed by a full bath.

2. Frictions over the body with the following mixture:

℞.	Glycerine	2 parts.
	Gum tragacanth	1-100 part.
	Flowers of sulphur	1 "
	Carbonate of soda	½ "

After this a second full bath must be taken. The linen of the patient and the bed linen must be carefully laundered, and gloves which have been used must be burned. On the next day it will be useful to give emollient baths, and to apply powdered starch or glycerite of starch.—*Nouveaux Remèdes*, May 24.

THE
Journal of the American Medical Association.
PUBLISHED WEEKLY.

THE EDITOR OF THIS JOURNAL would be glad to receive any items of general interest in regard to local events, or matters that it is desirable to call to the attention of the profession. Letters written for publication or containing items of information should be accompanied by the writer's full name and address, although not necessarily to be published. All communications in regard to editorial work should be addressed to the Editor.

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THE CONGRESS IN WASHINGTON.

In more than one respect was the Ninth International Congress a success. Some of our visiting confrères from Europe say that from a scientific standpoint no Congress ranks higher, and that the proceedings, when published, will reveal a wealth of learning among Americans of which the profession generally in Europe has been entirely ignorant. It is not from a boastful spirit that we quote this opinion, though even in that case we might be pardoned, since, truth to tell, many things have been said of us on the other side of the ocean that were anything but flattering.

Heretofore the knowledge of Europeans and Americans of one another—or we may in this case speak generically and say, of each other—has been one-sided. This is to be explained in great part by the one-sidedness of the visits. Many Americans go to Europe, but comparatively few Europeans come to America. Many of the Americans who go abroad, while wealthy, are not of the kind to produce a pleasant impression or raise our country and institutions in the estimation of foreigners.

Let us hope that whatever pleasant impressions were produced on our visitors from abroad, from whatever country they came, may be so lasting that they and others may be induced to visit us again, and that too before another International Medical Congress meets in this country. We would gladly know them better, and would have them know us better. We would have them feel, and will endeavor to show them that as science is not bounded by geographical lines nor limited by oceans or mountain chains, and as each laborer in the field of science, however humble and unknown he may be, can claim all other workers as his brothers, more especially when their chosen field of labor is the alleviation of human suffering, so hospitality, good feeling, brotherly kindness can and do have a home in America. It is not impossible that many of our visitors came, as Dr. Martin of Berlin said he came, with some doubts. Let us hope that, like him, all went away from Washington with the doubts all removed. And such was the case if he, and Dr. Grailey Hewitt, Dr. Landolt and Dr. Edmund Owen represented in their remarks on the last day of the Congress the sentiments of the other visitors. Dr. Hewitt said he was requested on the part of the foreign members of the Congress to express in a few words the sense which was entertained by them of this Congress and of the efforts which had been made by the Executive Committee of this Congress for the furtherance of the objects of this great meeting, and to convey to them the grateful thanks of the foreign members for the attention bestowed upon the matter and their grateful appreciation which has attended their efforts. He desired also to express their sense of the hospitality and the kindness and attention which they had received, both in public and in private, which would make their visit to Washington a source of gratification and happy memories in the future.

Dr. A. Martin, of Berlin, expressed in German his thanks for the kindness he and other members of the Congress had received and gratification at the success of the Congress. He had come here with some doubts. These were all removed, and the great success of this Congress would secure it a high rank among the Congresses that have been held. It had been the custom to engrave the names of the victors at Olympic games on plates of gold. They could not so record the names of their entertainers, and the only means of expression for their sentiments was by a vote of thanks.

Dr. Landoldt, of Paris, said: "I have been commissioned to express to the President of the United States our sentiments of profound gratitude. Although feeling that I am unable to find words proper for the occasion, I accepted the honor, since the gratitude that springs from the heart has no need of eloquence to make it understood." When the applause that this sentiment produced had subsided Dr. Landolt proceeded, saying:

"Mr. President and gentlemen, we have already assisted at a series of International Congresses. We have been well received everywhere. The countries of Europe have rivaled each other in their zeal to make our stay with them in their most beautiful cities pleasant, but it has not often been our lot to see the Chief of the State mingle in person among us and take part in our la-

bors. The President of this great Republic came among us to bid us welcome with his sympathetic voice. He invited us to his own home and gave to each of us a hearty grasp of the hand, significant of his most cordial hospitality. The sanction given by President Cleveland to our Congress has given the greatest charm to our stay in this Capital. Returning to our hearths we will preserve the most grateful and respectful remembrance of the President of the Republic, and we say to the whole world that the United States, already so favored, possesses above everything a Chief who directs them surely in the way of progress and prosperity."

Dr. Edmund Owen thought he was admirably qualified to discourse on American politics, as he was entirely ignorant of the subject. In science we have no politics. "We are extremely happy," he said, "to have visited the United States during the Presidency of Mr. Cleveland." He said he asked an American friend the other day, and a very intelligent man, if he voted for Mr. Cleveland, and the American said "no." Then he asked the American if he were satisfied now, and the laconic answer was, "guess I am." "If that question were put to this meeting, 'are we satisfied?' I say 'guess we are.' A great man like the President might have found something else to occupy his attention, say, in the White Mountains about this time of the year, he might have been driven away by the doctors, but instead of that he remained here to welcome them. When the history of this grand country is written we trust President Cleveland will have a niche in the temple of fame side by side with those great men, Lincoln and Garfield. When you are in our country we love to hear you say, 'We admire your Queen.' We can say to you with all truth, we admire, we love your Queen, her beauty and grace, and in seconding this vote of thanks, we simply express a prayer that Mr. President Cleveland and Mrs. Cleveland may long continue in strength and health to preside over a happy, a prosperous, and a united country."

We are sure that few if any will regret that the next Congress will be held in Berlin, and more especially since it will be presided over by the greatest of the great medical men of a great nation. Medicine is indebted to Germany for much, but probably most of all for Rudolph Virchow.

THE NEW LOCAL ANÆSTHETIC.

A few months ago we noticed the discovery by an Australian physician of an alleged new local anæsthetic, drumine, which does not thus far seem to have fulfilled all that was said and expected of it. It is to be hoped that the latest addition to our meagre list of vegetable local anæsthetics will not prove to be also a disappointment.

Stenocarpine, a supposed alkaloid from the leaves of a botanically unknown tree, after being tested by Dr. A. M. Seward, of Bergen Point, N. J., and Dr. J. Herbert Claiborne, Jr., of New York, has been more recently examined and carefully tested by DR. EDWARD JACKSON, of Philadelphia, who reports his observations in the *Medical News*, of September 3, 1887.

Before further describing its action it should be said that, whether the name "stenocarpine" will finally prove to be the correct term or not, it should not have been given to the drug until the tree from which it is obtained is definitely and botanically determined. As the matter now stands it is not at all certain whether the tree is the *Acacia stenocarpa*, *Gleditschia tricanthos* (Honey Locust), or *G. menosperma* (Water Locust), though the leaves are said to resemble those of an acacia. Mr. Goodman, a veterinary surgeon, who first noticed the apparent anæsthetic properties of a poultice made from "a pile of leaves raked hap-hazard from the ground," says that the source of the leaves containing the anæsthetic principle is known in Louisiana, where the substance was first used, as the Tear-blanket tree, which bears pod 8 or 10 inches long and slightly curved, containing seeds and a viscid juice. The tree grows to a height of 35 or 40 feet, with a diameter to the bole of about 18 inches, and a spread of foliage of about 30 to 35 feet. The tree is furnished with clumps of forked spines or thorns, long, tough and highly polished. This description corresponds very closely, if not exactly to what is known in the Southern States—and as far North certainly as Virginia—as the Honey Locust.

Dr. Seward found that it produced local anæsthesia in the eye of a cat, and Dr. Claiborne found that it produced local anæsthesia in the eye of the rabbit and of man; that gtt. ij of an aqueous solution produced complete insensibility of the cornea and conjunctiva in a few minutes, with dilatation of the pupils, the anæsthesia lasting about half an hour, and the dilatation of the pupils for 36 hours. As Dr. Claiborne reported that in some cases a few drops of a 2 per cent. solution on the skin caused almost absolute anæsthesia, so that tumors, warts, etc., could be painlessly removed. Complete local anæsthesia was also produced in the nose, and the instillation of a few drops in the ear permitted the touching of the membrana without pain.

Dr. Knapp, of New York, also experimented with the substance and produced anæsthesia of the mu-

cous membranes of the eye, nose, throat, urethra and rectum. Given hypodermatically it produced local anæsthesia of the skin, and a drop on the glans penis produced anæsthesia. Injected into the cellular tissue of rabbits it caused violent attacks of tetanoid convulsions, of which opisthotonos was a prominent feature, recurring every 10 to 40 seconds for about 15 minutes, and followed by recovery in an hour. From ♏ 5 to 25 was required to produce these symptoms. Death in 10 seconds was caused in a rabbit by the injection of ♏ 10 into a vein of the ear, fibullary convulsions or tremors of the anterior portion of the body preceding death. The symptoms closely resembled those caused by strychnia poisoning.

Dr. Edward Jackson experimented with some of the 2 per cent. solution. It was clear, of a faint brown tint, and distinctly bitter, and a few seconds after its application to the tongue and lips there was a peculiar sensation of the numbness precisely similar to that caused by cocaine, but more intense than that caused by the 4 per cent. solution of cocaine. Dr. Jackson has not seen constitutional symptoms produced in any human subject, though this may be accounted for by the fact that not over ♏ iv of the solution were used in any one case. He placed gtt.j in his left conjunctival sac, causing smarting more severe than any similar application of a 4 per cent. solution of cocaine, but still not severe, and passing off in a few seconds. This was followed by a feeling of "stiffness," "dryness," or "coldness" of the lids, such as cocaine produces, and an immediate widening of the palpebral fissure. Within 2½ minutes there was complete anæsthesia of the conjunctiva and cornea. In 20 minutes the anæsthesia was less complete, and in 1 hour entirely gone. The power of accommodation was very nearly or quite abolished in some cases by a single instillation, and was always abolished if the instillation was repeated. When no other mydriatic was used recovery of the accommodation and pupil was almost complete at the end of 3 days. When the drug was used to paralyze the accommodation in order to determine the refraction the results were satisfactory; in one case the subsequent use of duboisine revealing no additional hyperopia. When used simultaneously with duboisine, homatropine or hyoscyamine it caused a wider dilatation of the pupil than did the other mydriatic.

Dr. Jackson could not determine positively that it caused any change in the degree of intra-ocular tension. In no case could it be perceived that the corneal changes which are sometimes produced by a 4 per cent. of cocaine took place after the use of this new drug. There seems to be less blanching of the conjunctiva in the normal eye and in those eyes suffering from acute catarrhal conjunctivitis than is the case from the use of a 4 per cent. solution of cocaine.

When injected under the skin of the forearm gr. jss of the solution caused complete anæsthesia of an area about 4×8 mm. in extent, reaching mainly from the seat of the injection *towards the extremity of the limb*. The anæsthesia was noted instantly, but seemed to extend its area for about 10 minutes, and disappeared in half an hour. By applying it externally to the skin Dr. Knapp failed to produce anæsthesia, but Dr. Jackson produced complete anæsthesia in this way. The point of application was simply kept moist with the solution, and the anæsthesia was very marked in 10 minutes, and continued to increase for 30 minutes, at the end of which time a needle could be plunged into the skin without the slightest sensation. In one of these trials on the flexor surface of his forearm, at the end of 10 minutes Dr. Jackson began an incision; and keeping the blood wiped away and the surface continually moist with the solution, completed it within 5 minutes more, to the depth of 3 mm., without the slightest unpleasant sensation, either at the time or afterwards. The anæsthesia is very superficial, and to make a painless incision in the skin it must be done by repeated superficial cuts with the knife, and at the same time keeping the cut surface bathed with the solution. A very important point, according to Dr. Jackson, is that the skin must not be previously treated with soap and water, or with any alkali, as in this way the alkaloid of the solution is promptly precipitated—and this is most probably the cause of Dr. Knapp's failure to produce anæsthesia of the skin by direct application of the solution. But when the alkaloid has been thus precipitated on the skin the application of a dilute acid solution will bring about anæsthesia.

In Dr. Jackson's opinion the solution used, said to be a 2 per cent. solution, is a more powerful anæsthetic than the 4 per cent. solution of cocaine, though the new drug seems to exert less influence on the local circulation and nutrition of the cornea than cocaine. It has a much greater power of paralyzing the accommodation than cocaine. And yet "the recovery after the use of the new drug is more rapid than after any other efficient mydriatic, except homatropine, and it has a more powerful influence over accommodation than homatropine. The superiority of the new drug in this direction is especially manifest in its ability to overcome the influence of eser-

ine. Thus the influence of cocaine on the pupil is overcome by one-fiftieth of its weight of eserine, and its influence on accommodation by still less. Homatropine is neutralized by one-eighth its weight of eserine. But this drug requires two-thirds or four-fifths of its weight of the myotic to overcome it. If it is a local anæsthetic more powerful than cocaine, and a mydriatic more powerful yet brief in its action as homatropine, it must be a new drug, and one of great practical importance."

NEW DISEASE OF THE LIPS AND MOUTH.

MR. JONATHAN HUTCHINSON has recently drawn attention to a disease which, he believes, up to the present has not been recognized. It is a form of inflammation of the lips and mouth in which superficial ulcerations occur, followed sooner or later by some form of skin disease and leading to a fatal termination. The exact form of skin disease varies, but the hands and feet are the parts usually affected, the nails being especially prone to suffer. In some cases the eruption may consist of bullæ, followed by free papillary outgrowths. No special antecedents can be alleged as the probable cause of the malady, but the disease has only been observed in middle life or in early senile periods. If not checked by treatment the disease appeared to run its course in about six months, death being produced by exhaustion. Mr. Hutchinson considers that opium given in repeated doses will cure it, and that there is hardly any tendency to relapse afterwards. All the best marked cases he had observed in males, but in several milder ones the patients were women. Careful inquiry had failed to support the suspicion that the disease might be due to contagion from animals. He has lost two patients by death; both were those first observed, and since the discovery of the signal efficacy of opium, no case had ended fatally. The observation as to the efficacy of opium was simultaneously made by Mr. Pollock and Mr. Hutchinson, two different patients being at the same time under their separate treatment and recovering under this drug. Since that, every case yielded if the dose of opium were sufficiently pushed. In one, however, the disease did not yield quickly, and for more than a month seemed likely to end in death. As regards permanency of cure, in one case the patient was known to be quite well four years after his recovery; in another the same result had occurred; and in a third a period of two years had elapsed. In two of the milder cases, the disease had repeatedly recurred. A great variety of remedies was tried without benefit before the use of opium was resorted to. One thing particularly noted was the fact that in no single case had there appeared to be any tendency to spontaneous improvement. In all cases the inflammation of the mouth and lips took precedence of the skin symptoms, and in some the latter were very slight. Another fact was that he did not know of any case that had as yet been obtained amongst the poorer classes of society. Mr. Hutchinson suggests that the affection is allied to other forms of disturbed health attended by skin disease and occurring in early senile periods, such as certain peculiar varieties of pemphigus, pityriasis rubra, psoriasis and lichen planus. In confirmation of this suggestion he mentions a case of an elderly lady who had a kind of spreading eczema-psoriasis of the hands and scalp. She lost her hair and nails, and was rapidly failing in health in spite of various measures of treatment, but finally recovered quickly and completely under opium; but her case did not belong to the class described, because she never at any time had inflammation of the mouth.

A MYOPIC HORSE.—One of the attractions, and an observed of all observers, of the Clinton market-place in Boston not long since, as we learn from a daily paper, was a horse wearing spectacles. The animal was very near-sighted, and an oculist took the necessary measurements and had a pair of concave glasses made for it. Unfortunately the report does not state just how the animal was examined, whether he can count fingers at ten feet, or what Jaeger test type he can now read.

SOCIETY PROCEEDINGS.

AMERICAN DERMATOLOGICAL ASSOCIATION.

Eleventh Annual Meeting, held in the Hall of the State Medical and Chirurgical Society, Baltimore, August 31 and September 1 and 2, 1887.

(*Concluded from page 347.*)

THURSDAY,—SECOND DAY.

At the business meeting the following were elected

OFFICERS FOR THE ENSUING YEAR.

President.—Dr. I. E. Atkinson, of Baltimore.
Vice-President.—Dr. P. A. Morrow, of New York.
Secretary and Treasurer.—Dr. G. H. Tilden, of Boston.

The report of the Committee on the *Congress of American Physicians and Surgeons* was received and adopted.

Dr. I. E. Atkinson, of Baltimore, was appointed

representative to the Executive Committee of the Congress, and Dr. G. H. Tilden, of Boston, alternate.

Dr. E. B. Bronson, of New York, presented a

CLASSIFICATION OF DISEASES OF THE SKIN.

The classification was made upon an anatomical basis. The cutaneous affections were divided into the following five classes: 1. Idiopathic neuroses. 2. Angioses. 3. Epidermidoses. 4. Cryptoses. 5. Dermoses. Diseases of the skin were further subdivided into sub-orders, tribe, families, genera and species.

Dr. P. G. Unna: We can never have a complete, definite, scientific classification of affections of the skin. As the knowledge of disease progresses so must our classification change. The ideal classification would be one made not upon an anatomical but upon an etiological basis.

Dr. L. D. Bulkley: I would express great admiration for the classification which has been presented, but I think that it is hardly suited for practical every-day use. As an attempt to scientifically classify diseases of the skin, it is far in advance of any classification yet offered.

Dr. L. A. Duhring, of Philadelphia, read a paper on

THE DIAGNOSIS OF DERMATITIS HERPETIFORMIS.

The author had been led to believe from the perusal of various reports of cases that this affection was not thoroughly understood. He therefore thought it desirable to offer some remarks with reference to its diagnosis. The chief characteristic of the affection is the multiformity of the lesions manifested in the natural evolution of the disease. If a given case remain sufficiently long under observation, multiformity of lesion will sooner or later be noted, and this will repeat itself. Blebs, vesicles and pustules may appear together or separately. Mixed eruptions are the most common, vesicles predominating. In one attack or another only one kind of lesion may be present. The disease presents clearly defined characters in distinct elementary lesion, and certain distinctive abortive lesions. Secondary forms of lesions also exist. Pigmentation of a dirty yellow or brownish hue, and variegated, is usually a marked feature in chronic cases. Excoriations from scratching, with thickening of the skin, usually exist. In no other affection are such varied combinations of lesions met with as in dermatitis herpetiformis. Erythema and vesicles, or vesicles and blebs, or blebs and pustules frequently exist side by side in close proximity with more or less pigmentation, excoriation and secondary changes. Itching is usually a most distressing symptom, and is most severe in the vesicular variety. In the pustular form, subjective symptoms may be wanting. The disease is extremely chronic, extending over a number of years. In two cases under the author's observation, the duration had been thirteen and eleven years respectively, and the disease was still active, with no prospect of cure. The eruption tends to recur at variable periods, usually six or eight weeks. Some cases of dermatitis herpetiformis closely resemble cases of erythema multiformis, but the lesions of the former disease are less sharply defined and the course of the two affections is different; erythema multiformis, being an acute disease of short duration. The disease occasionally resembles herpes iris, but the chronicity of the affection would exclude herpes iris. The lesions are also more virulent and accompanied by a more profound degree of cutaneous disturbance. Herpes iris is a benign affection, running an acute course and terminating in recovery, although subject to relapses. When the bullous varieties exist alone they may resemble pemphigus vulgaris. The combination with other lesions will, however, prevent any confusion in the diagnosis.

With reference to the term dermatitis herpetiformis, the author stated that he had adopted it in preference to dermatitis multiformis for the reason that there was already a disease named erythema multiformis, and the use of the term dermatitis multiformis might lead to confusion and give rise to the opinion that it was simply an advanced stage of erythema multiformis.

Dr. L. D. Bulkley: I wish to briefly report a case showing some of the difficulties of diagnosis. A man was admitted to the hospital with remarkable skin lesions, and the case was regarded by all who saw it as one of dermatitis herpetiformis. The patient was suffering with fever, and the temperature remained high until death. In connection with the lesion of the skin there was a general alopecia of the body. At the autopsy, generalized sarcoma was found affecting the spinal cord and various internal organs. Whether or not the cutaneous lesions were simply the manifestation of the internal disease I cannot say.

The President: I cannot help thinking that the author has included in his description diseases of quite different nature. Some of these cases are analogous to the old hydroa, others may be of septicæmic origin, while possibly some may be the result of local irritation. It seems unphilosophical to consider these different conditions under one head. I have seen as the result of bites of insects, lesions corresponding to those described in some of the cases of dermatitis herpetiformis. I should hardly consider such a case as an example of this disease.

Dr. P. G. Unna, of Hamburg read a paper on

THE TREATMENT OF LEPROSY.

The speaker, after referring to the fact that leprosy was usually considered incurable, and that as a consequence treatment was not resorted to, stated that he had recently treated five cases of this affection with encouraging results. The treatment consists in the external use of the following ointment:

Chrysarobin	5 parts.
Ichthyol	5 "
Salicylic acid	2 "
Vaseline	100 "

This is applied to the nodules on all parts of the body, with the exception of those on the face, neck and hands. In the latter situations pyrogallic acid is substituted for the chrysarobin in the above formula. Such an application may be continued for months. For some of the older nodules this is not sufficiently strong; for these the author uses salicylic acid or salicylic acid and chrysarobin in the form of

a plaster on muslin. This is allowed to remain two or three days or a week. Under this application the tubercle drops out. In the first cases treated by this method there has been a rapid disappearance of the leprous matter in the skin. There was also in these cases a decided improvement in the general condition, although no internal remedies were given, the object being to test the efficacy of external applications.

DR. P. A. MORROW, of New York: I have recently had the opportunity of treating a number of cases of leprosy and I believe that certain cases of leprosy are responsive to chaulmoogra oil as are cases of syphilis to mercury. In the case of a Norwegian, the subject of tubercular leprosy, the lesions have disappeared, and he has apparently recovered under the use of chaulmoogra oil. On a number of the nodules of the face I used caustic potash, and they disappeared very rapidly. Some cases, however, fail entirely to respond to this treatment.

THE PRESIDENT: Some time ago, I treated a young man from Bermuda. When he entered the hospital he was unable even to dress himself. He was given a preparation containing strychnia, and in six weeks was engaged in rowing the boat across the river. I have also used nux vomica in as full doses as the patient would tolerate. I am in the habit of associating this with the external use of chaulmoogra oil.

AFTERNOON SESSION.

DR. H. W. STELWAGON, of Philadelphia, read a paper on

THE USE OF MEDICATED RUBBER PLASTERS IN CERTAIN CUTANEOUS DISEASES.

He has used rubber plasters containing a certain amount of such substances as chrysarobin, pyrogallic acid, ammoniated mercury, and oxide of zinc. The special field of these plasters is in the treatment of certain chronic affections, such as sluggish patches of eczema, psoriasis, callosities and ring-worm. A 10–20 per cent. plaster of salicylic acid is useful in the treatment of callosities. In lupus vulgaris the effect from pyrogallic acid plaster was equal to that from the use of the ointment. Chrysarobin plaster has been used with advantage in ring-worm. The application may be allowed to remain in place for one or two weeks.

DR. P. G. UNNA: In the plasters which I have employed, the plaster mass is spread upon muslin much more flexible than that on which the rubber plaster is spread. The adhesive material which I have employed has been either the oleate of aluminium or the best India-rubber. As little of the adhesive material as possible is employed; not more than 2 to 5 grams to the square metre. The strength of the plaster is reckoned not by percentage, but as so many grams of the active agent to the metre.

DR. H. G. PIFFARD, of New York, read a paper on

SALT IN DERMAL HYGIENE AND THERAPEUTICS.

Ordinary sea water contains 2 per cent. of saline matter. It also contains an organic matter which gives to the skin a slimy feel after coming out of the bath. On entering sea water at a temperature of 70° a momentary chill is experienced, which soon passes off. In the course of half an hour a second chill is felt, due to the gradual abstraction of the body heat. This persists as long as the individual remains in the water. In robust individuals, who leave the water before the occurrence of the second chill, sea bathing may prove beneficial, but in feeble persons, the sea-bath as ordinarily taken is apt to result in harm; mainly, he thought, through abstraction of the body heat by the water. The local effects upon the skin coincide with the general effects. In vigorous persons psoriasis and dermic eczema will often be benefited by a short bath followed by rubbing. If the patient be feeble or the bath prolonged the result will be unfavorable. Prickly heat, pruritic affections and furuncles are often benefited by sea-bathing. The principal precautions with reference to sea-bathing are not to go into the water when it is too cold, and not to remain in it until the occurrence of the second chill.

The author had also experimented with artificial brine varying in strength from .5 to 25 per cent. When the percentage reaches 25 per cent., the change can be detected by the feeling. If genuine sea-salt is used the sticky, clammy feeling is apparent. If white salt is used, there is a sensation of extreme cleanliness. A 5 per cent solution, used as a bath at a temperature of 95° and the immersion continued 15 to 20 minutes, removes the bodily odors and exudations better than a bath with soap, and the body remains free from odor for a longer period than if soap has been used. The skin presents a condition of softness not seen after any other bath. A bath of a 20 to 25 per cent. salt solution had been also used with no irritating effect except upon the mucous membrane. In this strength of solution the water does not seem to wet the skin, but rolls off leaving the body dry.

In acute eczema the use of ordinary water is, as a rule, followed by a temporary aggravation of the trouble. In these cases a full bath of .5 to 1 per cent. solution has been used with great comfort to the patient. In sub-acute eczema, psoriasis, furuncles, in irritable summer rashes, whether papular or pustular, and in ulcerating syphilides, a 5 per cent. solution of salt may be used with great advantage. The salt-water bath should be used as hot as can be borne, continued 15 to 20 minutes, and should be taken just before retiring. Genuine sea-salt is not so good for the bath as coarse white salt, on account of the slimy feeling which is left. The therapeutic effects are identical.

DR. E. WIGGLESWORTH: Was any effect upon the growth of the hair observed?

DR. PIFFARD: My observation in reference to this point is limited to my own person. I have this summer noticed an unusual growth of the body hair. Whether or not this was due to the daily use of a strong saline bath, I cannot say.

DR. L. A. DUHRING, of Philadelphia, reported

TWO CASES OF TYPICAL IMPETIGO SIMPLEX.

Considerable skepticism exists concerning the ex-

istence of a distinctive disease entitled to the name impetigo simplex. Impetigo is one of the rarest of cutaneous affections.

Case 1.—A boy æt. 4 years, and well nourished, was brought to the author with the history that, two weeks previously, he had some itching, and this was followed by the appearance of white lumps. Shortly after this, pustules formed. They appeared a few at a time, lasted several days and then dried up. At the time of observation there existed about two dozen lesions upon the fingers, toes and legs. These were typical pustules of the size of a split pea, raised about one line above the surface of the surrounding skin. They were seated upon bright-red, non-indurated bases. They were discrete and manifested no tendency to group. Microscopical examination did not reveal the presence of any fungus. The process ran its course in about three weeks, no local or internal treatment being employed.

Case 2.—A boy æt. 4 years, perfectly healthy, presented a discrete pustular eruption which had appeared seven days previously. Twenty or thirty small pustules with a slight areola were found. These were most marked on the fingers and toes. The pustules had thick walls and showed no tendency to rupture. There was no itching. The disease terminated in spontaneous cure in two or three weeks. The disease in neither of these cases appeared to be contagious.

Dr. H. W. Stelwagon, of Philadelphia, reported

A CASE OF PURPURA WITH CIRCINATE LESIONS.

The patient, a strong and robust man, came under observation in April, 1887. The abdomen was found to be the seat of a macular, reddish-yellow eruption of annular form. The lesions were about the size of a dime. Most of them were almost completely annular in form. The eruption was most profuse on the anterior part of the trunk. The lesions were of a hæmorrhagic nature, there being no hyperæmia. The eruption had appeared as small white spots, three months previously, above the umbilicus, and had gradually extended. There were no subjective symptoms and the general health was good. The case remained under observation for three weeks and then was not seen for four months. The eruption had then almost disappeared; the whole duration of the case was about nine months.

So far as the author was aware only one other case of this character had been reported, and that was put on record by Drs. Duhring and Harlingen.

Dr. S. Sherwell, of Brooklyn, read a paper entitled:

PROTEST AGAINST EXCESSIVE STRENGTH OF LOCAL APPLICATIONS IN SKIN DISEASES.

The author claimed that most of the local applications of the pharmacopœia were too strong to be used with safety. Instead of diluting these preparations, it is better to order a preparation of the desired strength, for after a preparation has been kept some time it seems to become more irritating. Numerous illustrations of the views expressed in the paper were given.

The Society then adjourned.

FOREIGN CORRESPONDENCE

LUCERNE, BERNE AND GENEVA.[1]

Hofstetter—Tuberculosis of Ribs—Kocher—Antisepsis—Kocher's Method of Suturing—Antiseptic Catgut—Struma Operations—Injection of Salt Solution—Tubercular Synovitis of Elbow—Synovial Tuberculosis of Knee—Cavel—Tubercular Implantations in Animals—Julliard—Struma Operation—Hospital Tents.

Dear Dr. Fenger:—In Lucerne I visited the Kantonspital, which contains about 80 beds. The surgical wards are in charge of Dr. Hofstetter, a young surgeon of more than average ability. When I called he was just getting ready to remove a carcinoma of the mamma in a lady 76 years old. The tumor was about the size of a pullet's egg, firm, immovable and located at a point corresponding to the right margin of the left breast. The patient had noticed the swelling for several years, but it had given no particular inconvenience until recently, when it became painful and tender; axillary glands not enlarged. As the tumor appeared to be attached firmly to the bony wall of the chest preparations were made to excise portions of one or more ribs. The operation was performed under the usual precautions. As soon as the incision was made through the skin and subcutaneous tissue it was evident that the tumor was intimately connected with the surrounding tissue. During the dissection an abscess was opened, and on exploring its interior it became plain that the diagnosis was wrong, as the abscess communicated directly with the subjacent ribs, showing that it was a case of primary tuberculosis of the ribs. Sections 3 inches long of the 5th and 6th ribs were excised, and the latter showed a small but distinct tubercular cavity which had opened on the upper margin and had infected by contact the opposite rib and surrounding tissues.

During my journey I have seen a great many cases of tuberculosis of bones and joints in the aged, patients from 50 to 80 years old; and what is still more important I have seen excellent results after operative treatment in these cases. Age alone furnishes no contra-indication to operations for tubercular lesions.

From my acquaintance through literature I had always considered Kocher, of Berne, one of the ablest of living surgeons; and in this opinion I was only confirmed by a personal acquaintance. An old proverb says "Distance lends enchantment," and this is applicable to a number of surgeons whom I have met on my tour; the nearer you come to them, the more you know them and the more you see of them the more you become convinced that they are a veritable *lucus a non lucendo*. The opposite can be said of Kocher; the more you see of him and his work the greater he becomes. I consider him in every sense of the word the greatest surgeon I have ever seen. He is an accomplished scholar, an accurate careful diagnostician, a bold and dextrous op-

[1] By permission of Drs. Fenger and Senn.

erator, and a born teacher. He is only 47 years old, but looks much older. He is of slender build, and his whole appearance suggests thoughtfulness and hard work.

The surgical wards under his charge contain only 60 beds, but many rare and interesting cases. His large operating room is intended only for small operations before the whole class, and for demonstrations and examinations of cases from the Policlinic. In this room advanced students are allowed to perform minor operations under his personal supervision. The more important operations are performed in a smaller room, which is supplied with every possible convenience for antiseptic work; it is the most perfect operating room I have seen, Volkmann's not excepted. To the operations performed in this room only 5 or 6 students are admitted, and the regulations in writing posted on the door require that the students must not have been recently in the dissecting room or the pathological laboratory, and that they must come without collar, necktie, coat and vest; in fact must come into the operating room with nothing but shirt and breeches. In how far the female students who attend Kocher's clinic can and will comply with these rules I am unable to say, as none of them came during the days I attended.

For irrigation corrosive sublimate solution is used, for general use only 1:5000. When stronger solutions were used intoxication occurred quite frequently. The wounds are covered with a flannel compress of sublimated gauze, generally dusted over with iodoform just before it is applied, and over this a cushion of aseptic moss.

Kocher has a way of suturing wounds which should be more generally known, as it is done rapidly and neatly. It is a form of continued suture, either with fine silk or catgut. A long straight needle is threaded with the suturing material, and as an assistant makes traction with a blunt hook upon each angle of the wound so as to straighten its margins (a procedure which greatly facilitates the suturing) the needle is passed alternately deeply and superficially, so that approximation and coaptation sutures follow one another. In this way a large wound can be stitched accurately in a few minutes. For drainage, glass tubes or rubber drains are used. Kocher's hæmostatic forceps are the best for general use. His struma director is not only a useful instrument for strumectomy, but is very handy in all operations in which deep dissections are necessary close to large vessels.

As I was passing through the surgical wards I counted 4 patients who had been recently operated on for struma, and they were all doing well. Kocher informed me that recently wounds were inclined to suppurate a little, and he was unable to trace this to any tangible cause, but was inclined to believe that the catgut which was used was not quite aseptic. He has been using catgut prepared in the ordinary way, but will return to his juniper catgut. Dr. Cavel has examined catgut made by Kocher's method, and has not always found it aseptic. By experiment he has found that if the raw catgut be immersed in oil of juniper for 10 days it is perfectly aseptic, and if afterwards kept in absolute alcohol it remains so permanently. He advises that when the catgut is taken out of the juniper oil it be washed with sulphuric ether before being transferred to the alcohol, as otherwise particles of oil cling to it and irritate the wound.

I remained in Berne four days, and had an excellent opportunity to become familiar with the work in the surgical wards, but will only describe the operations of one forenoon to show what a man like Kocher can do in 4 hours. The operations began at 7 A.M., and a little after 11 o'clock the whole work was done. The world knows that Kocher's great specialty is strumectomy. He astonished us all a few years ago when he reported 101 cases of strumectomy at the time when he first called attention to the danger which follows complete extirpation of the thyroid gland, as in quite a number of his cases in which the whole organ was removed a condition allied to cretinism followed, which he described under the term cachexia strumipriva. He has now performed the operation more than 300 times, and his results have been so good that in 100 consecutive cases he has not had a single death. He looks upon excision of struma as one of the safe operations of surgery. I was very anxious to see the master of this operation confronted with a difficult case. Two cases were in the hospital awaiting strumectomy, and he selected for my special benefit the one which was expected to present the greatest difficulties.

The patient was a woman about 40 years old, who had had a large neck since childhood. For a number of years the tumor has been growing more rapidly, until at present it has reached the size of a fist, and is giving a great deal of difficulty in breathing, especially when the patient undergoes unusual exertion. She was very anæmic. The tumor was located almost centrally over the neck, but did not dip behind the sternum. No fluctuation. Chloroform was the anæsthetic, and was continued throughout the operation. The external incision was made over the centre of the tumor, and obliquely across the neck. Even before the tumor was reached a number of vessels had to be divided between the forceps. The veins all around and beneath the tumor had walls as thin as paper, so that attempts to ligate them failed, and venous hæmorrhage had to be guarded against by compression. Another difficulty from these thin-walled veins was that many times large trunks were accidentally injured in the blunt separation of the tumor from its surrounding tissues. The extirpation lasted over an hour, and all the forceps which the institution possessed, some 60 or 70 were brought into use, and at least another dozen would have been used had they been accessible. The patient, already anæmic, lost considerable blood during the operation, and after all vessels were ligated and the wound sutured, and as the dressings were to be applied, she passed into a condition of collapse, with rapid almost imperceptible pulse, dilated pupils, and extremely pallid countenance. The operator at once had the patient's head lowered and the lower extremities elevated, and at the same time injected ether hypodermatically. As

the heart did not respond he at once prepared for saline intravenous infundation. A saline solution 6:1000, temperature of the blood, was used. The median basilic vein was exposed, opened and a glass tube, connected with a rubber tube and an ordinary glass funnel, was introduced into the vein and tied firmly with a ligature. The fluid was allowed to flow very slowly, and a little more than a litre was introduced before the contractions of the heart became firmer and the pulse fuller. When this was done the pupils contracted, the patient became conscious and the operation was suspended. The dressing was now applied, and the patient put to bed with the head low and artificial heat about the periphery of of the body. An hour later the patient was conscious, the pulse still rapid but with a fair volume. Under such circumstances a man's courage is put to the severest test, but Kocher did not show the least excitement, and performed the transfusion as deliberately as though he was demonstrating the operation before his class on a cadaver. The day after the operation I examined the case with Kocher, and though the pulse still remained rapid, all other indications were favorable, and it is more than likely that this patient, snatched from almost certain death by prompt treatment, will ultimately recover.

Immediately after this patient left the operating room a boy 14 years old was brought in suffering with tubercular synovitis of the left elbow-joint. Kocher has also had an unusual experience with excision of the elbow. One of his assistants has collected all of his cases of excision of the elbow-joint, some 100 in number, and will in the near future publish the results in one of the medical journals. Kocher always makes a longitudinal incision over the centre of the olecranon process, and joins this with a shorter one at a right angle, in the direction of the radio-humeral joint, so as to have full access to the joint. The insertion of the triceps muscle is preserved by keeping close to the bone in separating the soft tissues from the olecranon process. The capsule is thoroughly extirpated, and as much of the bone with forceps and sharp spoon as is necessary, preserving in the case of children, whenever practicable, the epiphyseal cartilage. In this case a small detached sequestrum was found in the trochlea, showing conclusively that the disease began in the humerus. All small vessels were secured as they were divided, and the dressing was applied before the Esmarch's constrictor was removed. No splint was used as the copious dressing and careful bandaging secured adequate immobility in proper position for the resected joint.

The third case was an arthrectomy for primary tuberculosis of the synovial membrane of the knee-joint in an adult female. The usual horse-shoe incision was made, but this was joined by another incision extending along the inner margin of the patella. The cutaneous flaps were dissected back, and the bulging capsule of the joint came into view. The capsule was incised from one side, and a longitudinal incision dividing the capsule on the opposite side of the patella enabled the operator to dislocate this bone to either side, thus rendering the joint well accessible in all its remote corners after it was partially dislocated by forcible flexion of the leg. The greatest care was taken to remove every particle of the diseased capsule with knife and scissors, and where these were inapplicable the sharp spoon was vigorously used. After the joint was thoroughly cleared the patella was placed in its proper position, two openings made on either side for drainage, the wounds sutured, a copious dressing applied, and the limb placed upon an interrupted posterior splint with foot-board.

Thus ended the eventful forenoon. I gladly accepted an invitation to dinner sent by Mrs. Kocher to the hospital. After a substantial and elegant meal we rested for several hours in the beautiful garden behind the house, and the mental feast that awaited us here, if anything, surpassed our bodily enjoyment. Kocher has a small laboratory in the Pathological Institute in charge of Dr. Cavel, his private assistant, who has done some excellent work here.

Cavel has been studying in a systematic manner the diagnostic value of implantations of tubercular material in animals, mainly guinea-pigs. Granulation tissue from tubercular joints invariably produces acute, diffuse tuberculosis, and death in from 5 to 6 weeks. The course of the disease in the animal is typical: at the point of inoculation a hard nodule appears first, the result of traumatic response on the part of the tissues around the graft. Next a lymphatic gland becomes enlarged in the immediate vicinity of the inoculation, which is done in the flank; consequently the glands in the groin enlarge first. Often a whole chain of lymphatic glands can be felt in the groin. At a later stage the glands in the axilla become affected. At the post-mortem examination it is always found that of the internal organs the spleen becomes affected first, then the liver and lungs, but usually the disease is so diffuse that scarcely an organ remains exempt. When the diagnosis cannot be made between tuberculosis and syphilis, either clinically or by the microscope, inoculation always decides the matter. When the lesion is tubercular the animal always becomes tubercular and dies. When it is syphilis the inoculation is harmless and the animal remains well. I examined a number of the animals and satisfied myself of the truth of these assertions. So far only one animal that was inoculated with tubercular matter has lived for 5 months, and in this case a large abscess formed at the point of inoculation a few weeks after the operation. Examination of the contents of the abscess showed abundant bacilli tuberculosis. A gland in the groin remains enlarged, and the disease, if not arrested by the suppurative inflammation, may have become latent.

I reached Geneva just in time, as the evening I arrived Professor Julliard sent me word that he would enucleate a struma at 9 A.M. the following morning. I met the genial and courteous Professor at the appointed time in the Hopitâl Cantonal, and I saw the case he was going to operate on. The patient was a young man with a very short thick neck, and suffering a good deal from dyspnœa from a retro-

sternal struma. Externally the swelling could hardly be seen except when the head was thrown back; in this position a soft swelling could be felt just above the manubrium sterni. About 21 students, including 3 females, had gathered in the amphitheatre to see the operation.

The operation was begun without an anæsthetic, but the patient was so restless and noisy that chloroform had to be given. An incision was made in the median line of the neck and carried as far as the sternum; this exposed a number of very large veins, which were isolated with the operator's own curved forceps, and divided between two ligatures. The muscles over the tumor were partly cut and partly separated. As soon as the capsule of the tumor was reached enucleation was begun by a blunt curved scissors and the finger. During these manipulations the cyst was ruptured, and the empty sac was drawn forwards and carefully separated. A number of the bleeding points required ligation. The cyst seemed to spring from the isthmus of the gland. After the cyst was removed two more tumors were felt embedded in the right lobe of the gland; these were removed through an incision along the anterior border of the sterno-cleido-mastoid muscle in a similar manner. The bleeding, especially from the cut and torn surface of the gland, was quite profuse, and required many ligatures for its arrest. The wounds were dusted with iodoform, drained, and the edges sutured together. The suturing was done with a large curved needle fixed in a handle which is passed through the tissues on both sides and then threaded by an assistant. That the assistant did not always hit the eye of the needle with his thread of catgut as unerringly as the operator expected and demanded was not the fault of the assistant, but of the needle. Juilliard ought to deposit this needle in one of the antiquity shops of Geneva, and some enterprising Hebrew would find for it ready buyers who would cherish it as a relic of Pompeii or some other ancient and defunct city. The dressing that the wound received deserves mention. It was first covered with protective silk, next by half a dozen large sponges previously made aseptic by being kept in carbolized water, next came a compress of gauze large enough to cover the head and half of the chest, this was again covered by absorbent cotton, and lastly ordinary cotton to fill up spaces, and the last layer was impermeable paper. All these things were retained with gauze rollers, and lastly a rubber bandage. When the whole thing was done the patient looked like an Egyptian mummy.

The spray is still used in this clinic, and carbolic acid is preferred for an antiseptic solution. Julliard has the best collection of instruments I have ever seen in a hospital, and when I called later at his house I admired his own private collection, which is not as large, but very select. He has also quite a large library, and from the way in which pamphlets were kept and books arranged he keeps his library for useful rather than ornamental purposes. I think he is a diligent reader. His contributions to literature have been many and valuable. His wards contain 120 beds, but during the summer months, from the latter part of April to October, the patients live in tents and have the full benefit of open country air. Each tent or barrack has room for about 20 patients. During this time the rooms in the hospital remain vacant, and can be thoroughly prepared for the next winter. I think this plan should be more generally adopted, as it does not involve much expense. Julliard told me that all the tents did not cost over 6000 francs.

And now I am at the terminus of my journey, and will begin to retrace my steps to-morrow. I am perfectly satisfied with the results of my trip, as it has afforded me an opportunity to complete a part of my education which could have been done in no other way. I have seen many things, good and bad. We often learn as much by looking at the shady as the sunny side. I have accumulated enough material to keep my thoughts busy not only for months but for years.

N. SENN.

DOMESTIC CORRESPONDENCE

THE BURTON CASE.

Dear Sir:—In THE JOURNAL of September 3, the paper of Dr. W. T. Parker is mainly devoted to discussing the question whether the two bullet wounds described could have been self-inflicted, and if they were, which was first in point of time? In regard to the last question the consensus of opinion seems almost unanimous in favor of the position that the heart wound would be so instantaneously fatal as to preclude the idea of that being the primary injury.

As the only method of determining such a question is by the observation of the results of similar injuries, under conditions favorable for watching the entire process, it follows that any fact so observed, bearing directly on the issue, will possess a certain value, possibly sufficient to warrant its record. This consideration must therefore be the apology for a brief narrative of a case recently within the cognizance of the writer.

During a quarrel in a saloon one of the parties, a young man, was stabbed in the breast with a broad-bladed dirk knife, which penetrated the right ventricle, making a transverse wound one inch linear measurement in extent. After being struck the wounded man ran out of the door along a platform in front of the building, jumping to the ground a distance of 3 or 4 feet and continuing to run till he reached his boat, drawn up on the beach and distant from the saloon about 100 feet. As he endeavored to push the boat into the water he fell unconscious. His comrades lifted him into the boat and rowed to the opposite shore, a distance of 35 rods. He was lifted out of the boat and carried a few rods and laid upon the ground. He was still unconscious, but having been made to swallow a little brandy, he aroused into partial consciousness, and attempting to rise, fell back dead. He lived after the receipt of this injury not less than 25 minutes, and would have lived longer had he been let alone. There can be no doubt that this man retained consciousness and physical strength

after he was stabbed for a period of time sufficient to have emptied the contents of one pistol at least.

This case, therefore, so far as it has any relevancy to the questions propounded by Dr. Parker, corroborates the dictum of Prof. D. H. Agnew. Very truly,

ARTHUR YOUNG, M.D.

Prescott, Wis., September 6, 1887.

COCAINE SOLUTIONS.

Dear Sir:—When I first began the use of cocaine my plan was to have 6 or 8 ounces of a 4 per cent. solution prepared and keep it in my office, applying when necessary, until it was exhausted. I soon began to notice that at times its effect would be perfect, at other times seriously disappointing. On one occasion a patient came in for the introduction of a bougie. I injected a small quantity of the solution (which was the last of my bottle) into the urethra, retaining it some minutes, and then carefully introduced the instrument. He complained of great pain, feeling no relief from the cocaine. Two days later he returned for the same operation. In the meantime my bottle had been replenished with a *fresh* solution, which I injected as before, when I introduced the instrument, without pain, the patient expressing himself as not feeling it at all. I began to reflect. Why should cocaine fail at one time and succeed at another? I could see no difference in the two operations except one was with a fresh solution, the other perhaps ten days old. After this, in order to test the matter, I made a number of experiments on different cases, and was so thoroughly satisfied that I no longer keep the solution on hand, but instead the crystal muriate of cocaine, and prepare my solutions for each case; often without making an exact per cent., but simply mixing with a little water without weighing.

The results of these experiments may be summed up as follows:

1. Solutions of cocaine, even though admixed with boracic acid, gradually lose their anæsthetic powers.

2. Freshly made solutions, applied immediately, will never fail to give the most satisfactory results.

3. When freshly prepared, much weaker solutions will be needed than when kept on hand. A 2 per cent. strength is as effectual (when fresh) as a 4 per cent. two or three weeks old.

4. Fresh solutions are not productive of destructive inflammation to the eye, as has been attributed by some to older solutions.

It would probably be well to state, in conclusion, that in these experiments, its use has been chiefly confined to the male urethra. I always increase the strength of the solution in proportion to the pain to be produced. If a sensitive stricture is to be cut I use a strength of from 10 to 20 per cent.; if an examination is to be made or a bougie introduced a 2 to 4 per cent. answers every purpose.

W. F. GLENN, M.D.

Nashville, Tenn., August 29, 1887.

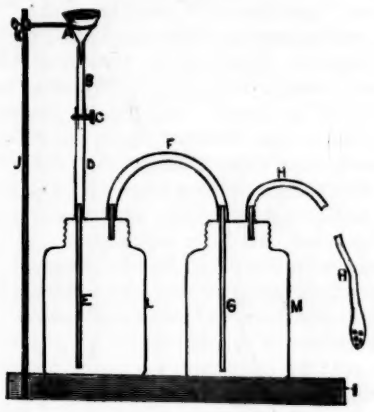
NEW INSTRUMENTS.

APPARATUS FOR GASEOUS INJECTIONS.

BY M. E. CONNELL, M.D.,

PHYSICIAN TO THE MILWAUKEE COUNTY HOSPITAL.

This apparatus does away with the gas reservoir or rubber bag. It can be extemporized very quickly and cheaply by any physician possessed of two fruit jars, a small piece of rubber tubing, a hard rubber cock and a glass funnel. I prefer it to the original apparatus. To physicians remote from instrument shops it may prove useful.



Solution X—is composed of

Sulphuric acid c. p.	7 ozs.
Water	2 pts.

Solution Y—is composed of

Sodium bicarbonate	1 oz.
Water	4 ozs.

Solution Z— is composed of

Calcium sulphide	5 grs.
Sodium chloride	5 grs.
Water	22 ozs.

Two ounces (2 ozs.) of sol. x is allowed to drop slowly (through A) into sol. y (in L), when carbonic acid gas is generated, which passes through sol. z (in M), and in combination with sulphuretted hydrogen is conveyed to the rectum through the tube H.

BOOK REVIEWS.

LEITFADEN ZUR ANTISEPTISCHEN WUNDBEHANDLUNG, mit Rücksicht auf ihren gegenwartigen Standpunkt. Von GEHEIMRATH VON NUSSBAUM in München. Fünfte, gänzlich umgearbeitete Auflage. 8vo., pp. xx, 308. Stuttgart: Verlag von Ferdinand Enke. 1887.

GUIDE TO THE ANTISEPTIC TREATMENT OF WOUNDS. By GEHEIMRATH VON NUSSBAUM. Fifth, completely revised edition. Stuttgart: Ferdinand Enke. 1887. Chicago: Koelling, Klappenbach & Kenkel.

Our readers will remember that in a very recent letter Dr. Senn said that this book had done "more towards the general adoption of antiseptic principles in the treatment of wounds than all the rest of the German literature combined." That it is appreciated outside of Germany is proved by the fact that

it has been translated into five languages; and the number of editions—five—shows that it is thoroughly appreciated at home. In 1880 the author said, in a lecture, that a physician who ignored antisepsis and had a patient die of pyæmia deserved to be mulct in damages—and for this he was roundly abused at the time. His statement is still more true to-day.

On account of the conciseness of this book, it would be difficult to do more than give a synopsis of the table of contents in the space at our command. The volume opens with an introduction on the present standpoint of wound treatment, which is followed by a chapter on "Infection, Intoxication (Fibrin Ferment, Fat Embolism)," of 17 pages. The third chapter, on "Accidental Wound Diseases," occupies 21 pages, and treats of Inflammation and Suppuration, Erysipelas, Diphtheria, Hospital Gangrene, Sepsis, Septicæmia, Ichoræmia, Pyæmia, and Pyosepthæmia. The fourth chapter is devoted to a consideration of the *Precautions against Infection of Wounds—the most important Part of the Treatment*, and one who thinks that he knows all about antiseptics and antiseptic dressings and materials should read it—and find that he is mistaken.

Apparently on the principle that example is better than precept, the author shows the reader, as clear as may be with words, a number of *Examples of Antiseptic Operations* in a chapter of 32 pages. These examples are: an operation for multilocular ovarian cyst, the record of which occupies 14 pages; amputation for crushed knee; osteotomy by MacEwen's method for genu valgum; and an antiseptic operation in the country, complicated luxation of humerus, resection of head of humerus. Other examples are also given in the chapter on "Antiseptic Dressings": wound of the head; hare-lip; operations for trigeminal neuralgia; for struma; for wound of the neck, involving the trachea and œsophagus; for cavernous tumor over the clavicle; for chest wound and empyema; for cancer of the breast; for penetrating wound of the abdomen; for pelvic phlegmon; for varicose ulcer of the leg; incarcerated hernia; cancer of the rectum; cancer of the uterus and vagina; compound fracture of the legs; old fracture of the patella, treated by suture; operation for club foot; nerve-stretching for neuritis ascendens; dressing for burn of the chest; and description of the treatment of fungous inflammation of joints by the spoon.

The most wonderful thing about this book is the immense amount of information that has been put into it. Could all authors imitate the style of Prof. Nussbaum we would have more valuable books, and fewer pages. Certainly we have but one book in our language, on a similar subject, which can be at all compared with it—Stephen Smith's "Operative Surgery."

MISCELLANEOUS.

POISONOUS HAM.—Recently at Carlisle, England, several persons were seized with dangerous symptoms of poisoning after eating some of an apparently good ham. Dr. Philip has from the ingesta in some of these cases obtained fairly pure extracts, and their physiological effects have been studied in frogs and in the human subject. The results of these experiments indicated that a poison of some potency had been present. The poison was not detected by the ordinary methods of analysis, and some of its features suggested relationship with the group of bodies relatively grouped as ptomaines or cadaveric alkaloids. It was probably traceable to some form of fermentation which, in turn, possibly depended on certain organisms which were discovered in the foods examined. The ascertained presence of such bodies gave important indications of treatment. With regard to the organisms which had been discovered in portions of the ham in question, certain preliminary difficulties had presented themselves in the process of staining, as probably some of the ingredients used in the process of curing prevented the tissues from receiving the stain so readily as usual. When sufficiently exposed the sections were found to contain micrococci. These were in groups both at the edge of the section and between the muscular bundles. They appeared to bear close relation to the tissues. The organisms were quite different from those usually discoverable in tainted ham. From their reaction with staining solutions, it was likely that the organisms had obtained access to the ham after it was cooked, and it is suggested that the condition of the cellar in which the hams had been kept subsequent to cooking affords a possible explanation of their appearance.

LONDON SCHOOL OF MEDICINE FOR WOMEN.—After being remodeled and extended, the London School of Medicine for Women has had a most successful session. The older portion of the school comprises a dissecting room, physiological and chemical laboratories, an excellent library; there is also a small but valuable anatomical and pathological museum, the latter containing an important collection of gynecological preparations. Students do not reside at the school, but for such as require it there is a hall of residence in connection with it, superintended by a committee. The only conspicuous lack of this rising young institution is a hospital of its own for the clinical instruction of its students. For the first three months of its existence this was a very formidable difficulty. A hospital of 150 beds or upwards is absolutely indispensable for a complete medical course, and for three years not a single institution in London would admit female students. In 1877, however, the Royal Free Hospital, not very far from the school, opened its wards. Still there remained another drawback; no English Board of Examiners would admit them to its examinations. They could take Continental diplomas, and those of King and Queen's College of Physicians of Dublin, but not a single Board would in England admit them until in June, 1877, the London University decided that women should thenceforth be permitted to present themselves for examination for degrees. There are now between 60 and 70 students at the school, and a complete list shows that at the present time there are 55 registered medical women, all duly qualified medical practitioners.

THE SUBSCRIPTIONS TO THE COMMEMORATIVE MEDAL of the Ninth International Medical Congress have proved nearly sufficient to cover the necessary expenses of engraving the die, striking the medal, furnishing a proper case, and mailing the completed medal to the subscribers. That all members of the Congress, however, may have an opportunity of possessing this memento, those who have not subscribed can yet do so any time within this month by forwarding the cost, $5.00, to Dr. J. M. Toner, 615 Louisiana Ave., Washington, D. C.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM SEPTEMBER 3, 1887, TO SEPTEMBER 9, 1887.

Major C. C. Byrne, Surgeon, detailed as a member of the Army Retiring Board in Washington City, vice Capt. Washington Matthews, Asst. Surgeon, relieved. Par. 2, S. O. 208, A. G. O., September 7, 1887.

Major R. M. O'Reilly, Surgeon, U. S. Army, ordered to proceed to Ft. Niagara, N. Y., on public business, and upon completion thereof, to return to his proper station, Washington, D. C. Par. 10, S. O. 205, A. G. O., September 3, 1887.

First Lieut. W. B. Banister, Asst. Surgeon, granted leave of absence for one month, with permission to apply for extension of one month, to take effect upon arrival at Ft. Lowell of Asst. Surgeon J. B. Girard. Par. 4, S. O. 91, Hdqrs. Dept. of Ariz., August 29, 1887.